CHEMISTRY

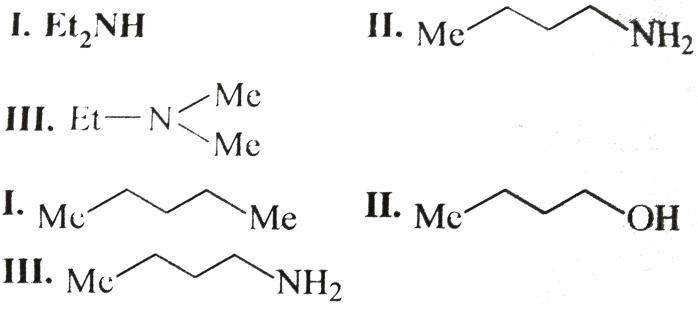
BOOKS - CENGAGE CHEMISTRY (HINGLISH)

ORGANIC COMPOUNDS WITH FUNCTIONAL GROUP

Illustration 15.1

1. Give the decresing order of boiling points for the following :

I. Et_2NH



II

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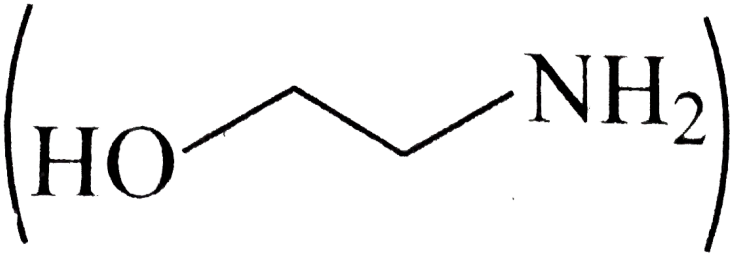
2. Give the decreasing orderof solubility of the following in H_2O:

(I)$PhNH_2, (II)Et_2NH, (III)EtNH_2$

(b)Give the decreasing order to boiling point of the followings:

(I) $EtOH$, (II) Me_2NH (II) $EtNH_2$

c. Ethanoamine



can form two differnt interamolecular $H-$ bonds. Write their structrues. Which form is more stable ?

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3. Why is an an amine of the type ` RR'R''N chiral and why cannot their enamtimers be separated ?

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4. Arrange the following in the decreasing order of their basic strength :

a. i. $PhNH_2$ ii.$EtNH_2$ ii. $EtNH_2$ iii. Et_2NH iv, NH_3

b. i. $EtNH_2$ ii. $PhNH_2$ iii . NH_3 iv. $PhCH_2NH_2$

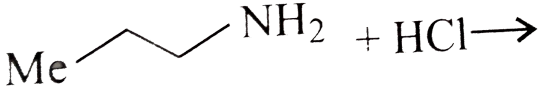
v.Et_2NH

c. i. $EtNH_2$ ii. Et_2 ii. Et_3N iv $PhCH_2NH_2$

d. i. $MeNH_2$ ii. Me_2NH ii.Me_3N iv. $PhNH_2$

v. $PhCH_2NH_2$

II. Complete the following acid -base reaction and name the products .

i. 

ii. $Et_3N + HCl \longrightarrow$

i.

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5. Write chemical reactions for the following :

a. Reaction of ethanolic NH_3 with $EtBr$.

b. Ammonolusis of benzlbromide and reaction of amine so formed with 2 mol $MeBr$.

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6. a. Prepare n-butylamine by Gabriel synthesis .

b. Which of the following cannot be prepared by Gabriel methaod from their corresponding halides or tosylates .

I. t-Butylamine , II . Neopentylamine ,

III. Diethylamine , IV. P-Toluidine ,

V. m-Nitroaniline ,

Vi. Vinylamine , VII. p-Nitroaniline , VIII. o-Nitroaniline , and XI. Allylamine .

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7. a. What kind of halides cannot be used to alkylate an amine :

b. Give the first amine formed from the reaction of $I.\ MeCl + EtNH, II, CH_2 = CHCH_2Cl + Me_2NH,$ and III. $PhCH_2Cl + EtNHMe.$

c. Identify (A) to (E).

$$PhSO_2Br + PrNH_2 \xrightarrow{-HCl} (A) \xrightarrow{KOH} (B) \xrightarrow{EtBr}$$

$$(D) + (E) \xleftarrow{H_3O^{\oplus}} (C)$$

d. Complete the following reactions :

i. 

Oxirane
(A)

$\xrightarrow{NH_3}$ (B) $\xrightarrow{(A)}$ (C) $\xrightarrow{(A)}$ (D)

ii. 

Thirane
(E)

$\xrightarrow{NH_3}$ (F) $\xrightarrow{(E)}$ (G) $\xrightarrow{(E)}$ (H)

i.

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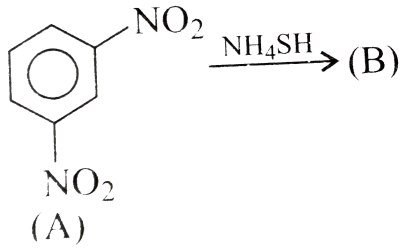
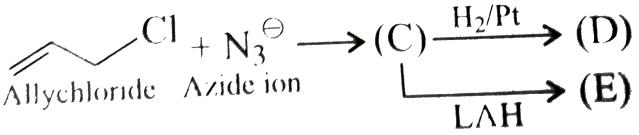
8. Complete the following :

i. 

ii. 

i.`

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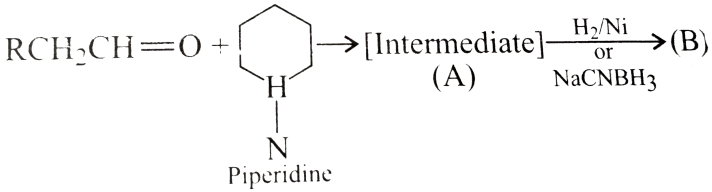
9. Complete the folllwing reactions :

a. 

a.

b.

$$PhCH=O+PhNH_2 \rightarrow \underset{(A)}{[\text{Intermediate}]} \xrightarrow[\text{or } NaCNBH_3]{H_2/Ni} (B)$$

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10. Complete the following reactions :

a. $Et_2NH + PhSO_2Cl \rightarrow$

c. $PhCH_2NH_2 + HCOOH \xrightarrow{\Delta}$

c. $PhNH_2 + PhCHO \rightarrow .$

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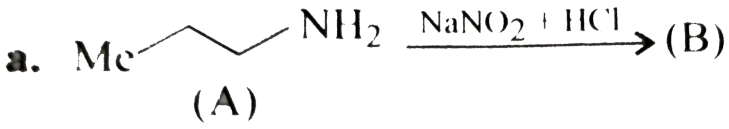
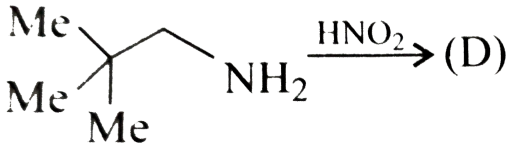
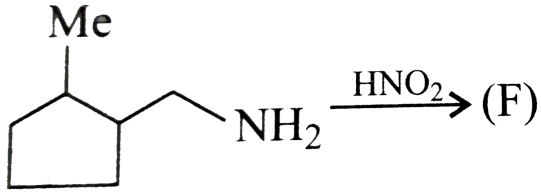
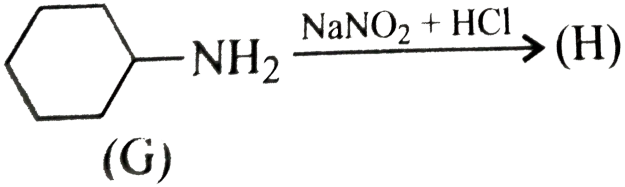
11. Complete the following reactions :

a. 

b. 

c. 

d. 

a.

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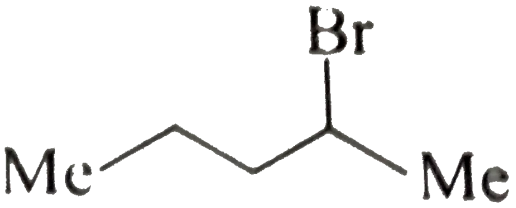
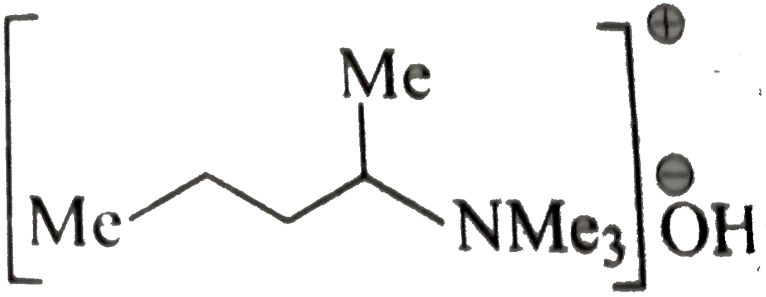
12. Explain :

I. Dehydrohalogenation of





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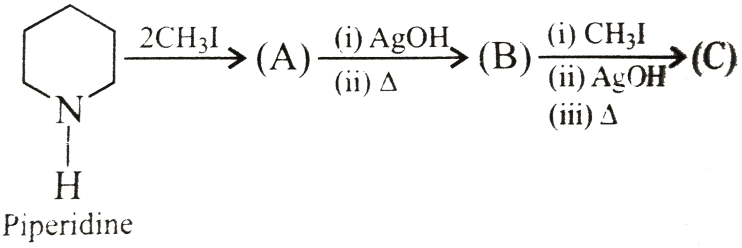
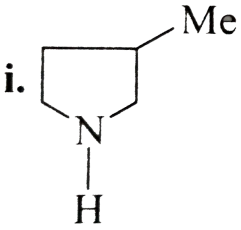
13. Complete the following :

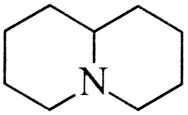
a.

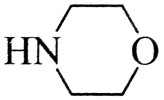


b. Give the products of the following by application of

Hofmann's exhaustive methylation and elimination :

i. 

ii. 

iii. 

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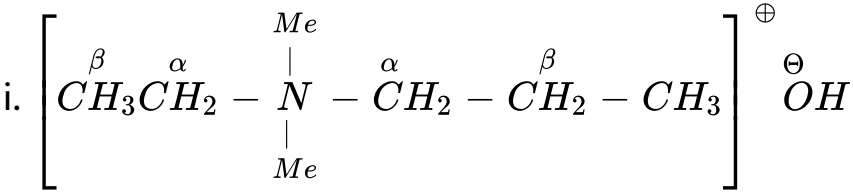
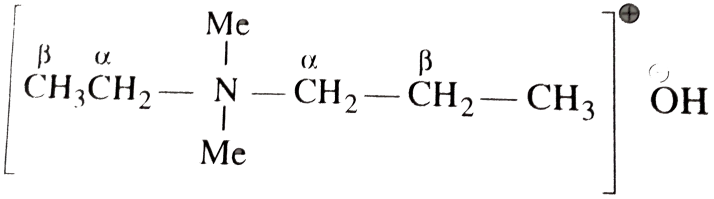
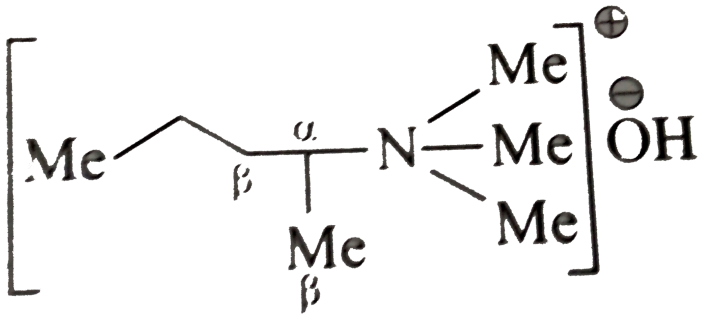
14. Give the alkene formed on heating the following (Hofmann degradation) :

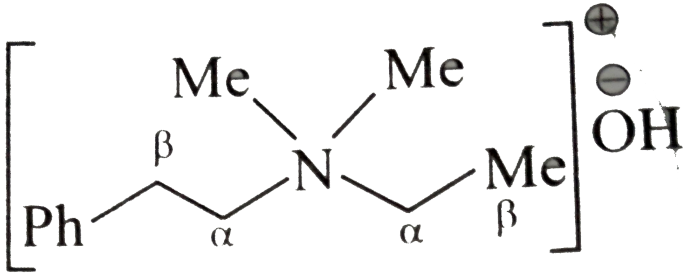
i. 

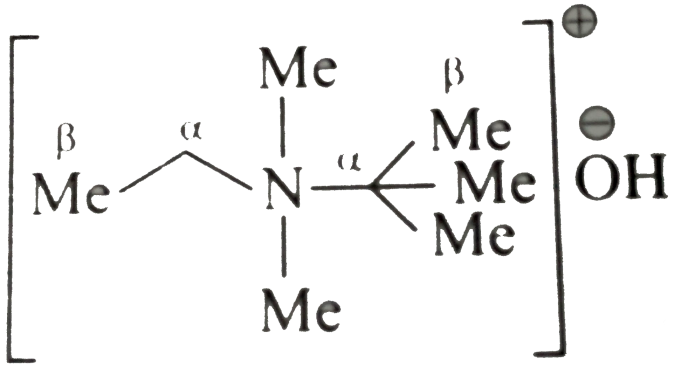
i. 

ii.

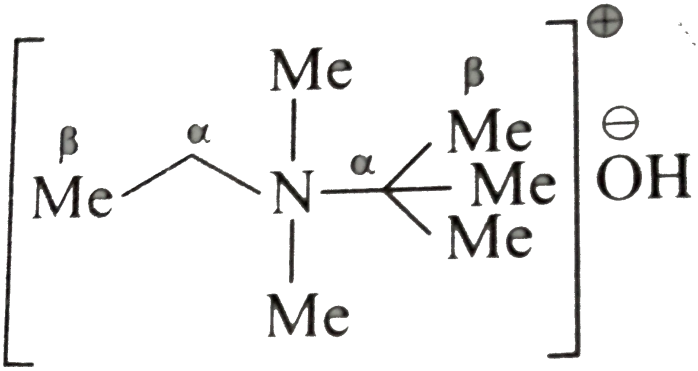
ii. 

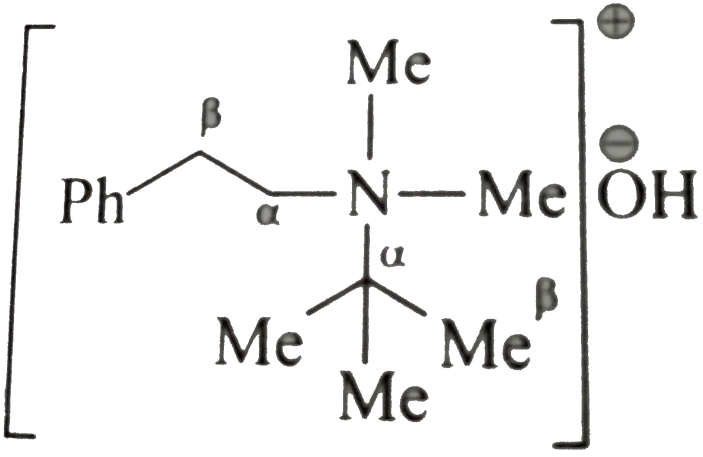
iii. `

iii. 

iv. 

iv.

iv. 

v. 

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15. Give the decreasing order of reactivity opf diazonium ion coupling with phenol.

a. I. $p-NO_2-C_6H_4\overset{\oplus}{N}_2$ II. $p-Cl-C_6H_4\overset{\oplus}{N}_2$

III. $C_6H_5\overset{\oplus}{N}_2$ IV. $p-Me-C_6H_4\overset{\oplus}{N}_2$

V. $p-MeO-C_6H_4\overset{\oplus}{N}_2$

b. I. $p-NO_2-C_6H_4\overset{\oplus}{N}_2$ II. $m-NO_2-C_2-C_6H_4\overset{\oplus}{N}_2$

III. $p-Cl-C_6H_4\overset{\oplus}{N}_2$ IV. $m-Cl-C_6H_4\overset{\oplus}{N}_2$ IV. $Phoveset(\oplus)(N_2)$

c. I. $m-NO_2-C_6H_4\overset{\oplus}{N}_2$ II. m-MeO-C_6 H_4 overset (o+) (N_2)III. p- MeO - C_6 H_4 overset (o+) (N_2)IV. o-MeO-C_6H_4 overset (o+) (N_2)IV. Ph oveset (o+) (N_2)`.

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16. Give the decreasing order of reactivity for the following coupling compounds with PhN_2Cl.

a. I. Aniline II. Phenol III. Toluene IV. Chlorobenzene V.

Nitrobenzee

b. I. toluene II. Ethyl benzene III. Cymene IV. T-Butyl benzene V. Anisole .

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17. Explain whty 2,4-dinitrobenzen diazoninum ion couples with anisole byt $PhN_2^{\oplus}$ does not. Write the coupling reactio .

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18. Synthesise benzylamine $(PhCH_2NH_2)$ by

a. Hofman degradation

b. Reductive amination

c. Alkyl halide amination

d. Gabriel method

e. Nitrile reduction .

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19. Starting from benzene or toluene or aniline and with the aid of diazonim salt synthesis the following : a. p-Nitrobenzene

b. p-Cyano benzoic acid

c. o-Bromotoluene

d. 1,3,5,-Tribromobenzene

e. m-Bromotoluene

f. m-Bromochlorobenzene

g. p-Iodotoluene .

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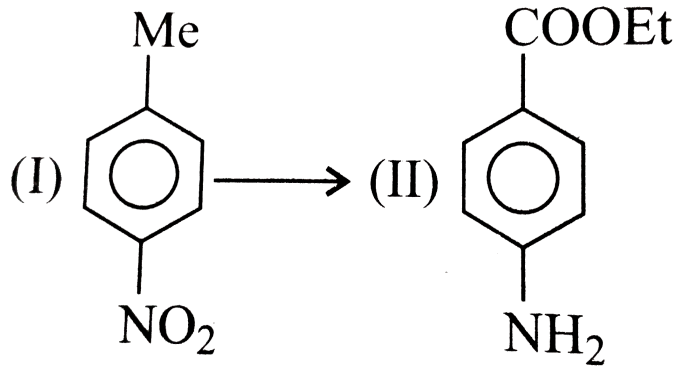
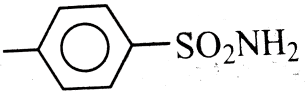
20. a.Convert the following

a. 

a.

b. **b.** (III) Aniline $\longrightarrow$ (IV) 

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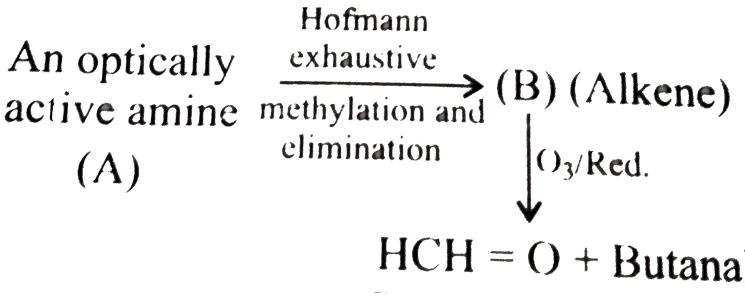
21. Identify (A) and (B).



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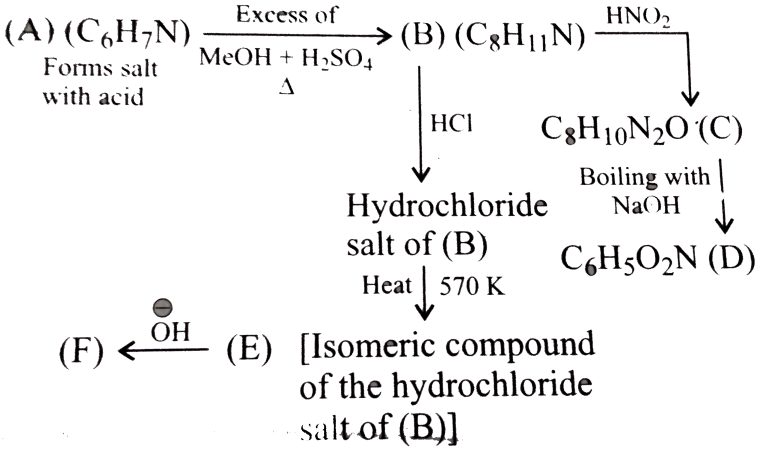
22. Identify (A) to (E) and write chemical equations for the vairous reactions involed .



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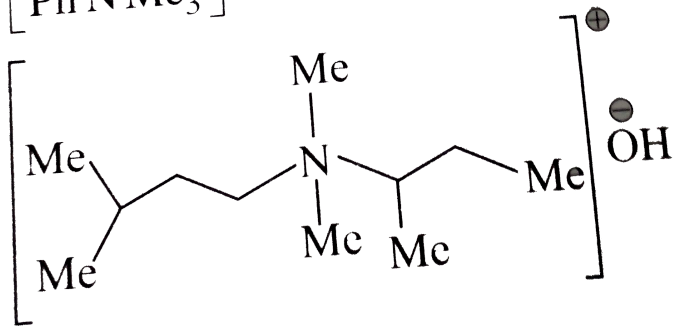
23. Give the major alkene resulting from the thermal decomposition of hydroxide salt of the following:

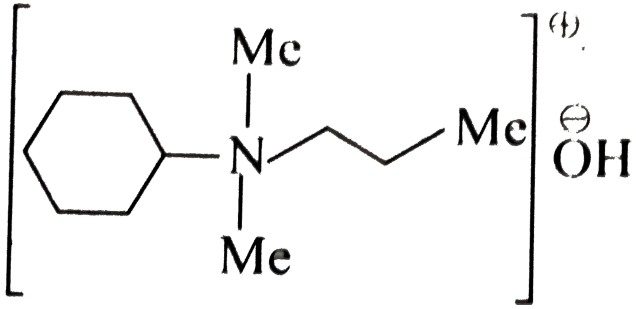
$\left[PhN\overset{\oplus}{M}e_3\right]\overset{\Theta}{O}H$

a. $\left[\mathrm{Ph\,N\,Me_3}\right]\mathrm{OH}$

b.



c.



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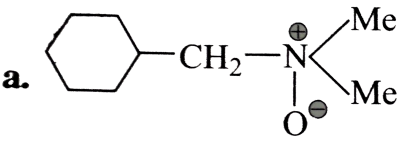
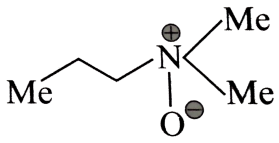
24. Give the product obtained on heating the following :

a. 

b. 

a.

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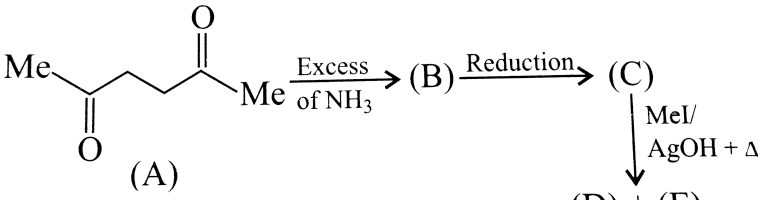
25. Complete the following :



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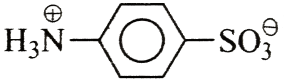
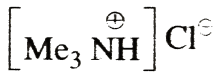
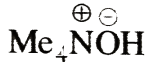
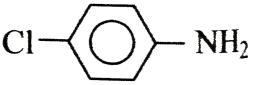
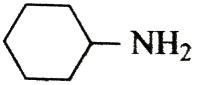
Solved Examples

1. Distinguish between the following pairs:

$((I),,.(II)),\left(a.\ (PhNH_3)_2^+ SO_4^{2-}\right.$,and,

	(I)		(II)
a.	$(PhNH_3)_2^+ SO_4^{2-}$	and	
b.	$Me_4N^{\oplus}Cl^{\ominus}$	and	
c.	$PhNMe_2$	and	PHNHMe
d.	$Me_2N—CH_2OH$	and	
e.		and	
f.	$PhNH_2$	and	
g.	PhNHCOMe	and	$PhNH_2$

,(b.

$Me_4N^{\oplus}CI^{\Theta}$,and,$\left.\left[Me_3\overset{\oplus}{N}H\right]CI^{\Theta}\right),(c.\ PhNMe_2$

,and,PHNHMe),(d.Me_2N-CH_2OH,and,

$\left.Me_4\overset{\oplus}{N}\overset{\Theta}{O}H\right),\left(e.\ Ph\overset{\oplus}{N}H_3CI^{\Theta}\right.$,and,(f.$PhNH_2$,and,

(g.PhNHCOMe,and,$PhNH_2$) :}

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2. Complete the following reactions.

a. $PhNO_2 \xrightarrow{Zn+aq.NH_4CI} (I)$

b. $p-Me-C_6H_4NO_2 \xrightarrow{As_2O_3/Aq.NaOH} (II)$

c. $m-Me-C_6H_4NO_2 \xrightarrow{LAH} (III)$

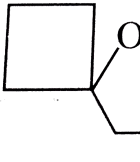
d. $PhNO_2 \xrightarrow{Zn+Alc.NaOH} (IV)$

e. $p-Me-C_6H_4NO_2 \xrightarrow[\text{or } Excess Zn/NaOH]{H_2NNH_2/\text{Raney } Ni} (V)$

f. $Ph\overset{\oplus}{N}_2Br^{\ominus} \xrightarrow{Na_2SO_3} (VI)$

g. $p-Et-C_6H_4\overset{\oplus}{N}_2Br^{\ominus} \xrightarrow[\text{power}]{Cu\text{bronze}} (VII)$

h.  $+ \text{I—N=C=O} \longrightarrow \text{(VIII)} \xrightarrow{H_2O} \text{(IX)}$

i.  $\xrightarrow{HNO_2} \text{(X)}$

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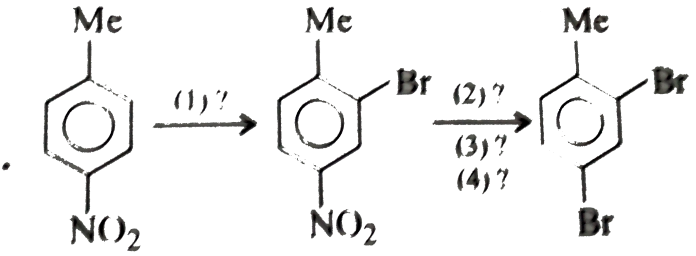
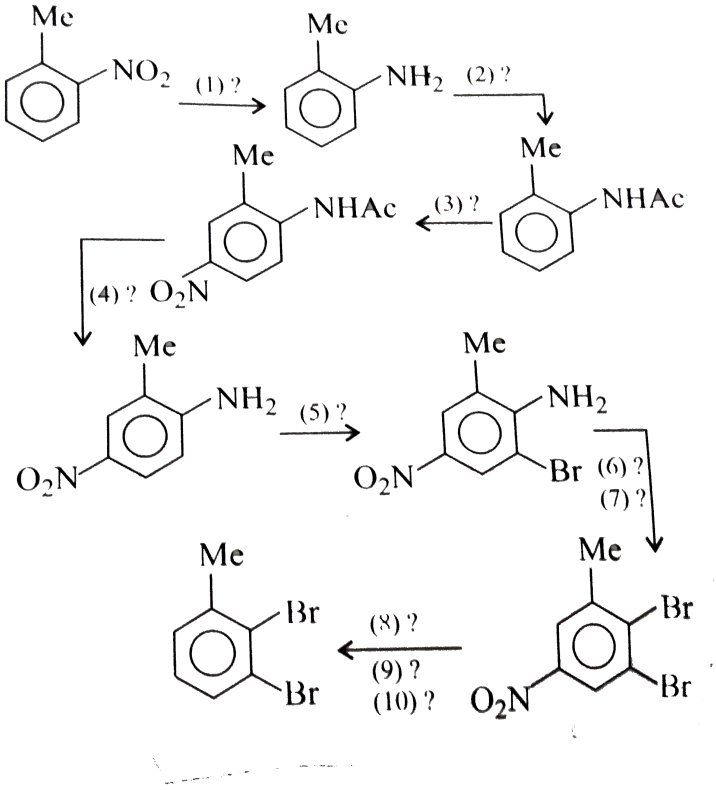
3. Give the reagents in the following reactions:

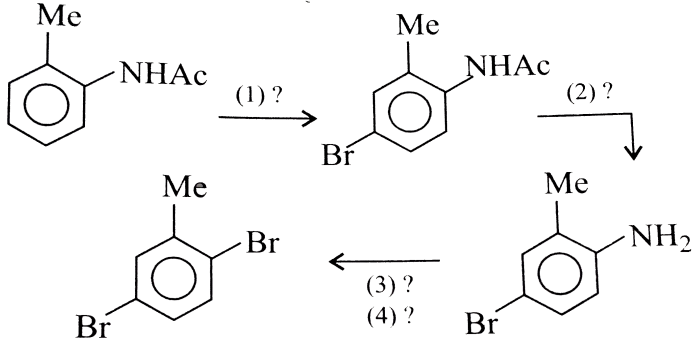
a.



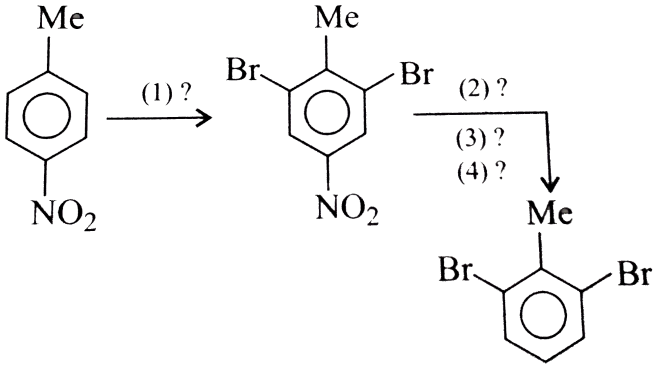
b.



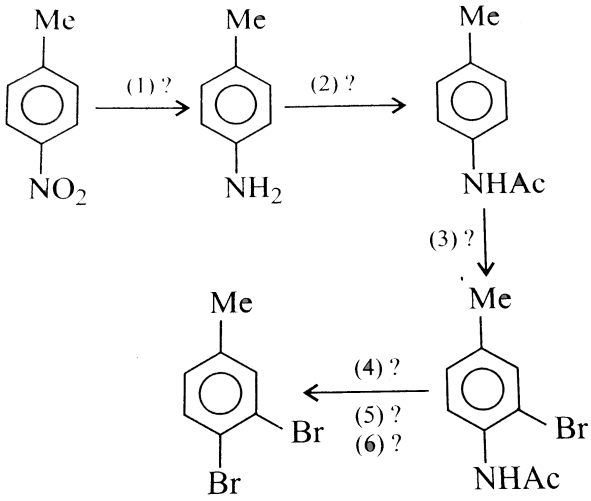
c.


Me
NHAc
(1) ?
Me
NHAc
Br
(2) ?
Me
NH2
Br
(3) ?
(4) ?
Me
Br
Br

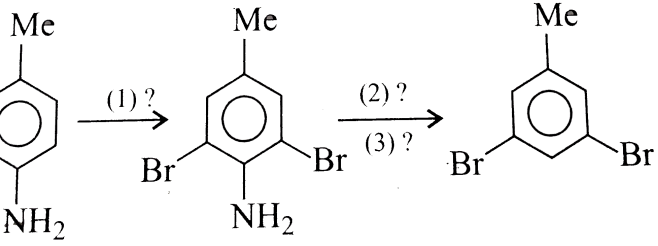
d.


Me
NO2
(1) ?
Me
Br
Br
NO2
(2) ?
(3) ?
(4) ?
Me
Br
Br

e.



f.



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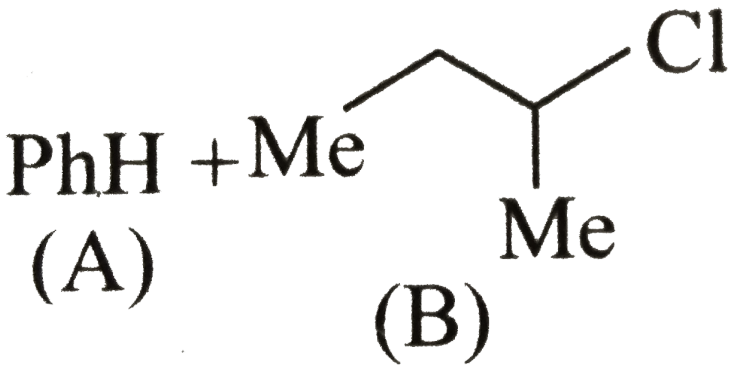
4. Complete the following reactions

a. $\underset{(A)}{PhNH_2} \xrightarrow[0.5^\circ C]{HNO_2} (B) \longrightarrow (C)$

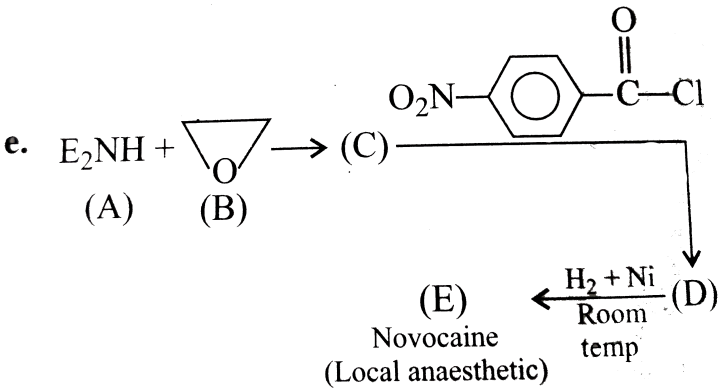
b.



c. $\underset{(A)}{PhCH=O} + \underset{(B)}{HCN} \rightarrow (C) \xrightarrow{LAH} D$

d. $\underset{(A)}{PhCH=O} + \underset{(B)}{MeNO_2} \xrightarrow{\overset{\Theta}{OH}} \xrightarrow[H^{\oplus}]{Fe, FeSO_4} D$

e.



e.

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5. Explain the formation of the mixture $PhCH_2CHO(I)$ and $PhCOMe(II)$ when $PhCH(OH)CH_2NH_2(A)$ is treated with HNO_2

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6. a. Distinguish between 1°, 2°, and 3° amines by using succine anhydride (A).

b. What are the limitations of Hinsberg reagent?

c. Give the structural formula of a chiral compound $C_8H_{11}N(X)$, which dissolves in dilute HCl and evolves N_2 gas with HNO_2.

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7. Identify compounds (A) through (E) in the following:

$$p-NO_2C_6H_4OH \xrightarrow[2.EtBr]{1.\overset{\Theta}{O}H} (A) \xrightarrow{Zn/HCl} (B) \xrightarrow[5^\circ C]{NaNO_2/HCl} (C) \xrightarrow{PhOH} (D) \xrightarrow{LiAlH_4} (E)+(F)$$

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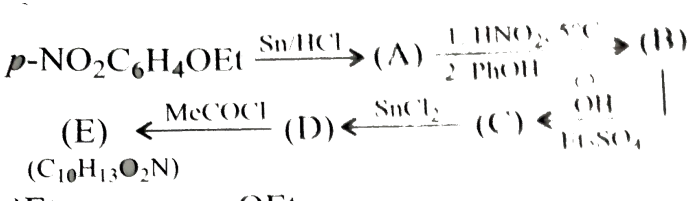
8. Identify compound (A) to (E) in the following:



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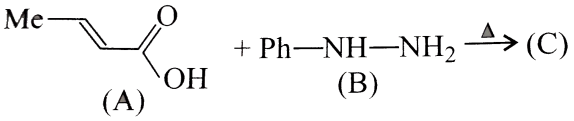
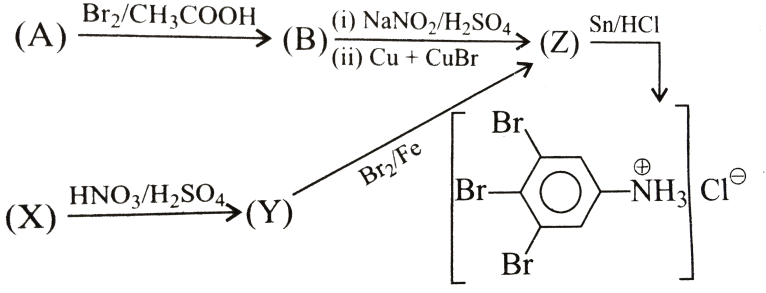
9. (a) Identify the products:



(b) Identify $(A), (B), (X), (Y)$ and (Z) in the following reactions.



(c) Convert benzene to *o*-nitro aniline as the only product.

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10. An organic compound (A) of molecular. Weight 135 on boiling with $NaOH$ extracts a gas which gives dense white

fumes on bringing a rod dipped in HCl near it. The alkaline solution thus obtained on acidification gives the precipitate of a compound (B), having molecular weight 136. treatment of (A) with HNO_2 also yields (B), whreas its treatement with Br_2/KOH gives (C). compound (C) reacts with cold HNO_2 to give (D) which gives red colour with ceric ammonium nitrate. on the other hand, (E) and isomer of (A) on boiling with dilute HCl gives an acid (F) , havign molecular wheight 136. on oxidation followed by heating, (F) gives an anhydride (G) which condenses with benzene in the presence of $AlCl_3$ to give anthraquinone. give structures of (A) to (G) with proper reasoning.

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11. The aqueous solution of a nitrogen and chlorine containing organic compound (A) is acidic to litmus. (A) on treatment with aqueous $NaOH$gives a compound (B) on treatement with $C_6H_5SO_2CI$ in the presence of $NaOH$ gives an insoluble product (C) $C_{13}H_{13}NO_2S$. give the structures of (A) and (B).

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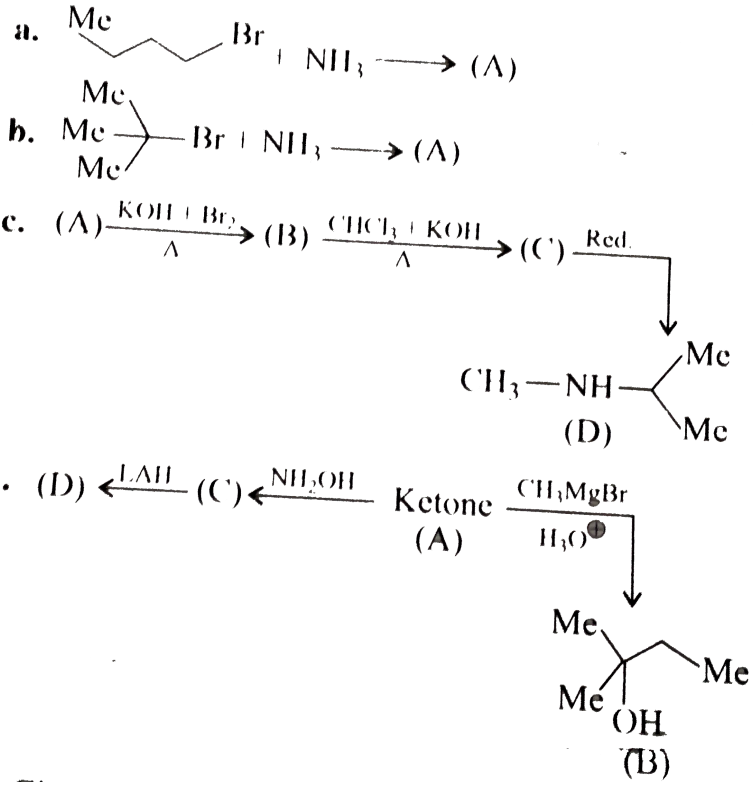
12. A mixture of two organic compound is added to cold water. After filtration, water-insoluble compound (A) burns with a smoky flame and it does not respond to Lassaigne's and Beilsteins test. When a small amount of this is added to $NaHCO_3$ solution, a colourless gas is evolved with effervescene. when this comopound is heated with

CH_3OH in acidic medium, it gives the characteristic smell of oil of wintergreen. compound (B), which is water soluble, burns with a non-smoky flame and its sodium extract is prepared with cane sugar. It gives the Prussian blue colour with freshly prepared solutions of $FeSO_4 + 2 - 3$ drops $NaOH$ and with few drops of H_2SO_4. when a small amount of this compound is heated in a dry test tube, a colourless gas is evolved that turns moist red litmus paper blue and a white residue is left. this white residue is dissolved in water and a drop of $CuSO_4$ is added in the basic medium -a violet colour is obtained. identify the compounds (A) and (B) with the help of the reactions involved.

View Text Solution

Exercises Subjective

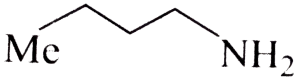
1. Identify :

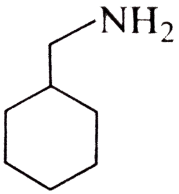


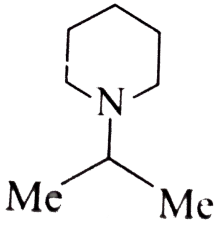
a. `

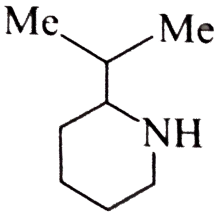
Give the reactants of the following amines obtained by

reduction with LAH.

i. 

ii. 

iii. 

iv. 

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2. Convert CH_3COOH into $(CH_3)_2NH$.

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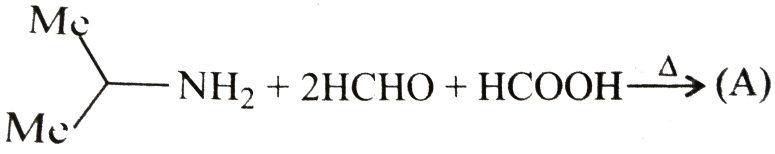
3. 

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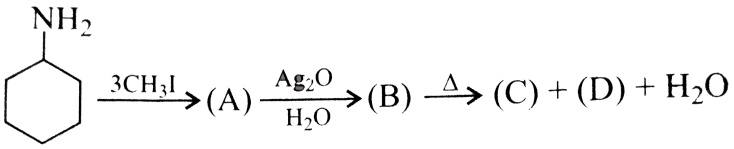
4. 

4.

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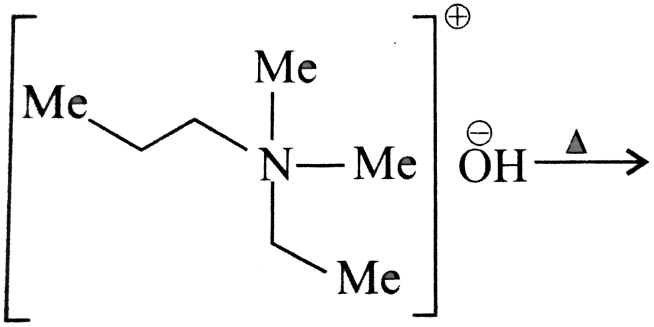
5. 

5.

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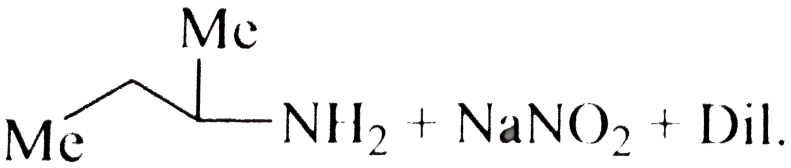
6. 

$NaNO_2 + Dil.\ HCI.$ What are the possible products?

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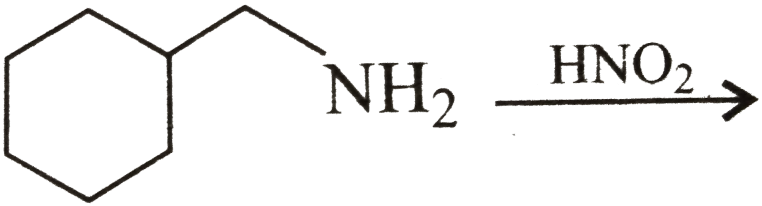
7. 

What are the possible products.

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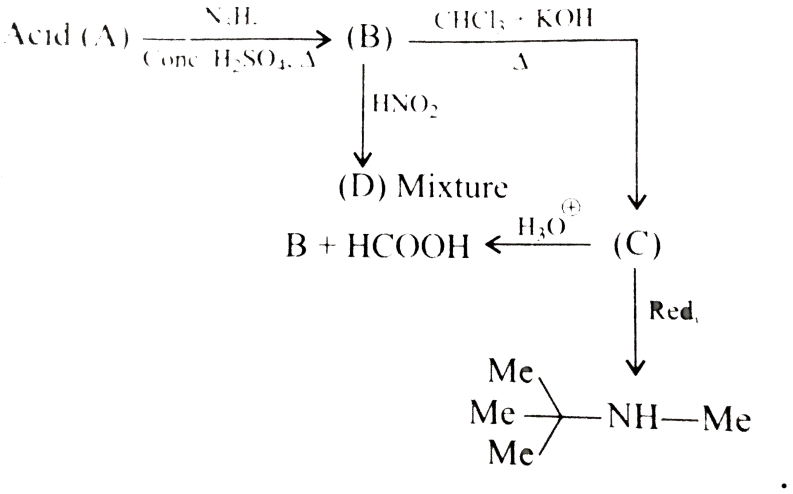
8. Identify (A),(B),(C) and (D).



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9. What happenes when the follwing react with HNO_2 ?

i. $CH_3CH_2I \xrightarrow{NaCN} (A) \xrightarrow[\text{Partial hydrolysis}]{\overset{\ominus}{O}H} (B)$

$(B) \xrightarrow[+\ Br_2]{NaOH} (C)$

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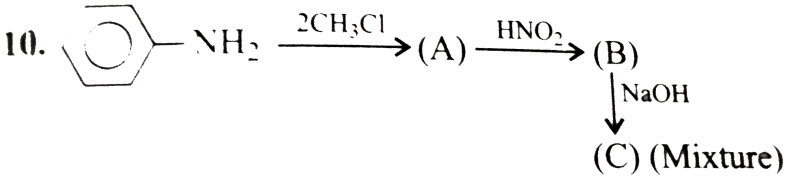
10. 

10. `

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11. C_3H_6N racts with Hinsberg reagent and the product formed is insoluble in alkali but soluble in ether . What is C_3H_9N?

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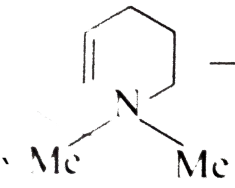
12.  $\xrightarrow[\text{or } O_3]{H_2O_2 \text{ or } H_2SO_5}$ (A) $\xrightarrow{\Delta}$ (B) + (C)

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13. a. Convert cyclohexyl amine into cyclopentyl amine .

b. Convert cyclohexene oxide into aminocyclohexamol.

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14. Arrange in the decreasing order of basic nature,

a. i. Pyrrole ii. Pyridine ii. Aniline

b. i. Diphenylamine ii. Aniline ii. Cyclohexyl amine

c. i. p-Nitroaniline ii. Aniline iii. P-Methyl aniline.

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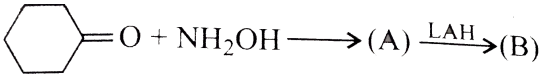
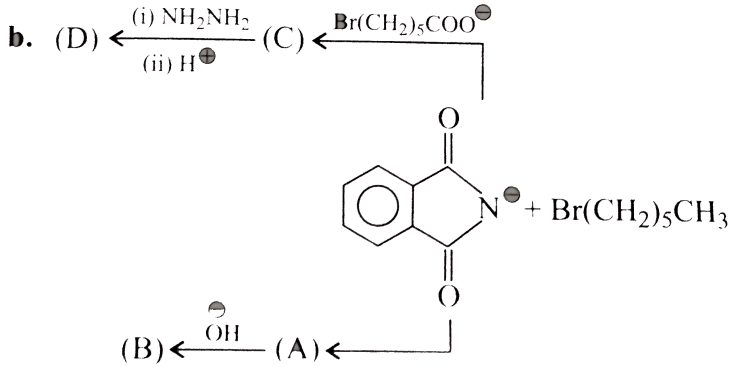
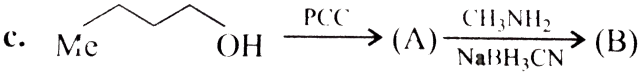
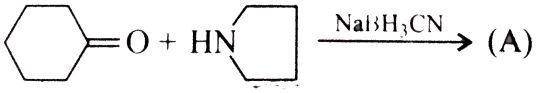
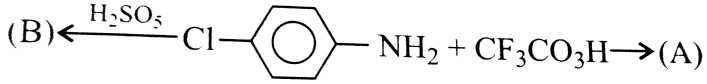
15. Complete the folowing :

a. 

b. 

c. 

d. 

e. 

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16. When tetramethyl ammonium hydroxide is heated strongly, it yields methanol and trimethylamine . How is methanol formed : To what general calss of reaction does this belong ?

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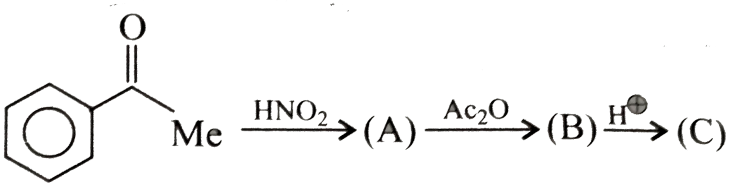
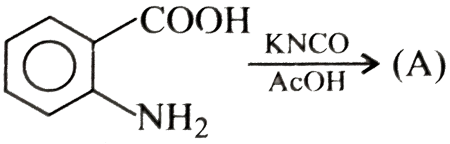
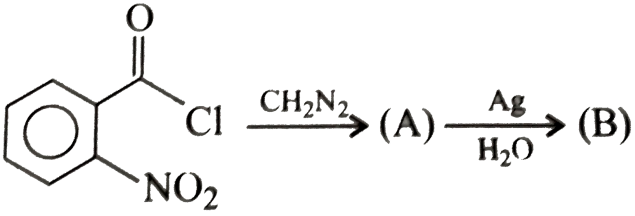
17. Complete the following :

a. 

b. 

c. 

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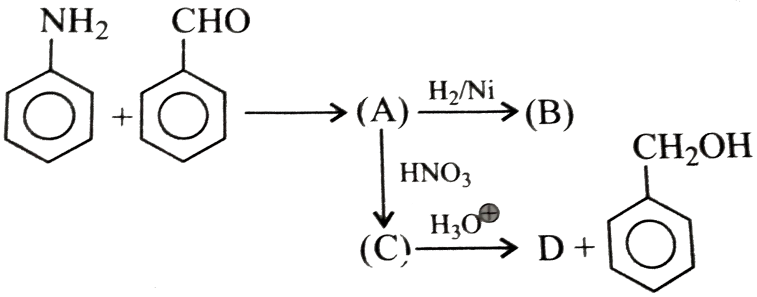
18. Complete the following :



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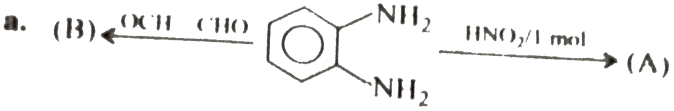
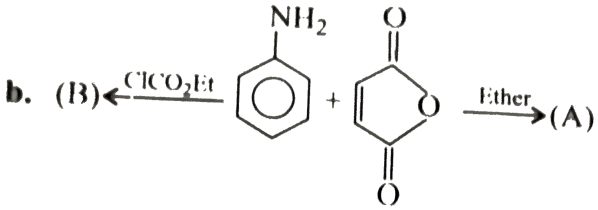
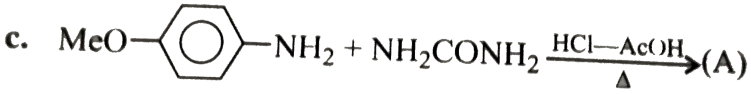
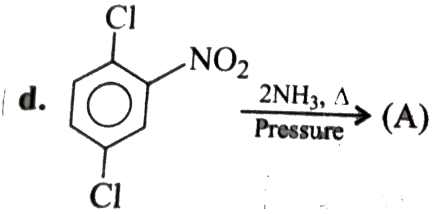
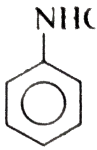
19. Complete the following :

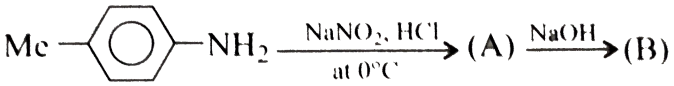
a. 

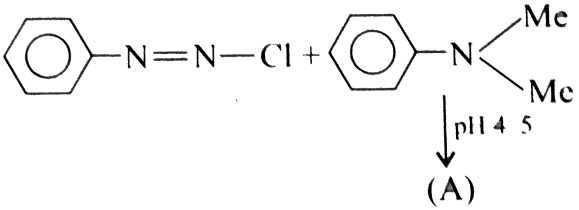
b. 

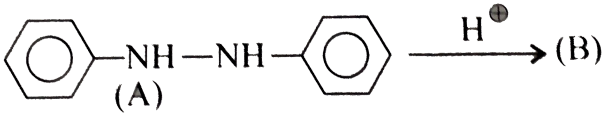
c. 

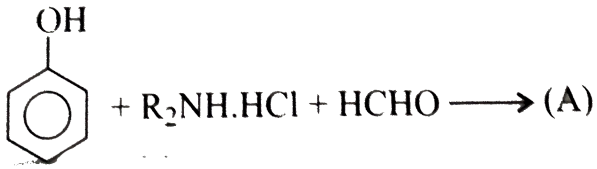
d. 

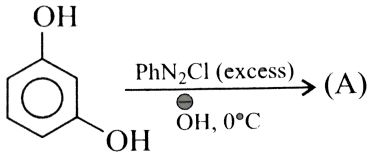
e. 
NHCOCH3
C2H5OH/hν
(A)

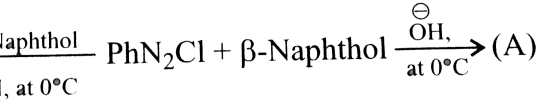
f. 
Me
NH2
NaNO2, HCl
at 0°C
(A)
NaOH
(B)

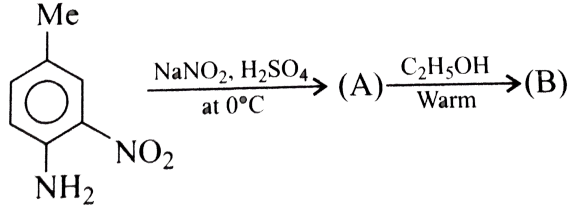
g. 
N=N—Cl +
N
Me
Me
pH 4–5
(A)

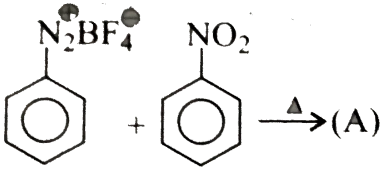
h. 
NH—NH
(A)
H⊕
(B)

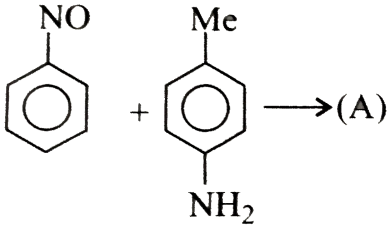
i. 
OH
+ R2NH.HCl + HCHO
(A)

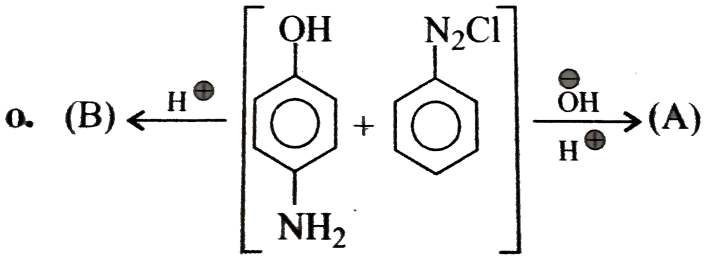
j. 
OH
PhN2Cl (excess)
⊖OH, 0°C
(A)
OH

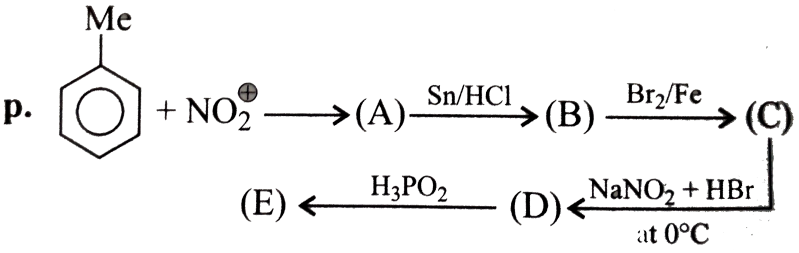
k. 
(B)
α-Naphthol
⊖OH, at 0°C
PhN2Cl + β-Naphthol
⊖OH,
at 0°C
(A)

l. 
Me
NO2
NH2
NaNO2, H2SO4
at 0°C
(A)
C2H5OH
Warm
(B)

m. 
$N_2BF_4^{\ominus}$
NO_2
Δ
(A)

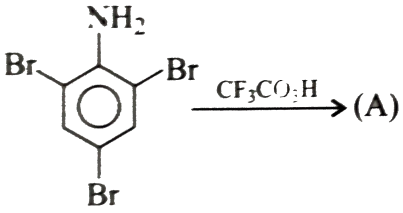
n. 
NO
Me
NH_2
(A)

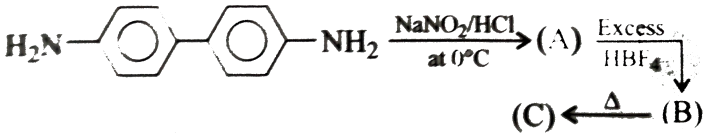
o. 
(B)
$H^{\oplus}$
OH
N_2Cl
NH_2
$\overset{\ominus}{OH}$
$H^{\oplus}$
(A)

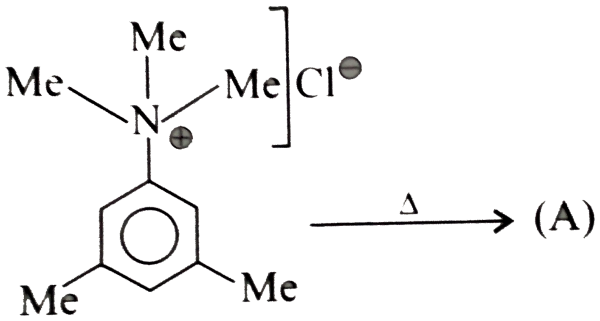
p. 
Me
$+ NO_2^{\oplus}$
(A)
Sn/HCl
(B)
Br_2/Fe
(C)
$NaNO_2$ + HBr
at 0°C
(D)
H_3PO_2
(E)

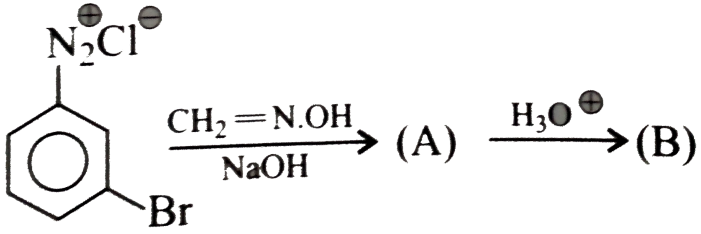
q. $PhN_2Cl + CH_2{=}N.OH \xrightarrow{H_3O^{\oplus}} (A)$

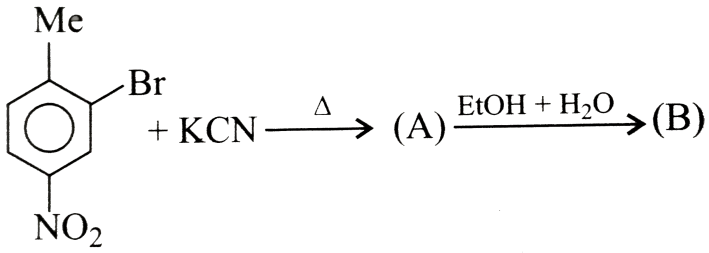
Formaldoxime

r. 

s. 

t. 

u. 

v. 

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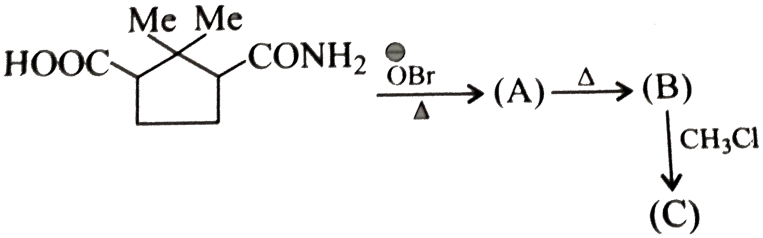
20. Identify (A) , (B) and (C) .



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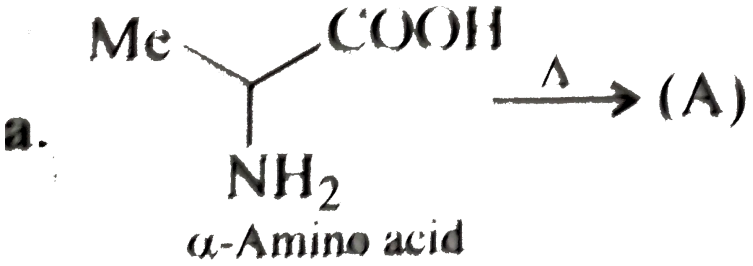
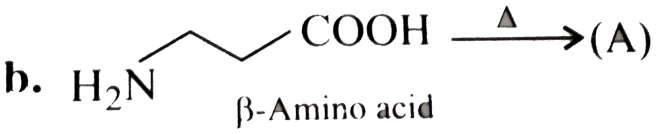


21. a.



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Exercises Concept Application

1. Wirte $IUPAC$ names of the following compounds and classity them into primary , secondary and tertiary amines .

i. $(CH_3)_2CHNH_2$ ii. $CH_3(CH_2)_2NH_2$

iii. $CH_2NHCH(CH_3)_2$ iv. $(CH_3)_3CNH_2$

v. $C_6H_5NHCH_3$ vi. $(CH_3CH_2)_2NCH_3$

vii. $m - BrC_6H_4NH_2$

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2. Give one chemical test to distinguish between the following pairs of compounds .

i. Methylamine and dimethylamine

ii. Secondary and tertiary amines

iii. Ethylamine and aniline

iv. Aniline and benzylamine

v. Aniline and N-methylaniline

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3. Account for the following:

(i) pK_b of aniline is more than that of methylamine.

(ii) Ethylamine is soluble in water whereas aniline is not.

(iii) Methylamine in water reacts with ferric chloride to precipitate hydrated feric oxide.

(iv) Although amino group is o– and p– directing in aromatic electrophilic substitution reactions, aniline on nitration gives a substantial amount of m-nitroaniline.

(v) Aniline does not undergo Friedel-Crafts reaction.

Diazonium salts of aromatic amines are more stable than those of aliphatic amines.

(vii) Gabriel phthalimide synthesis is preferred for synthesising primary amines.

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4. Convert :

i. Ethanoic acid into methanamine

ii. Hexanenitrile into 1-aminopentane

iii. Methanol to ethanoic acid

iv. Ethanoic acid into propanoic acid

v. Ethanamine into methanamine

iv. Methanamine into ethanamine

vii. Nitromethane into dimethulamine

viii. Propanoic acid into ethanoic acid .

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5. Describe a method for the identification of primary , secondary and tertiary amines . Also write the chemical

equations for the reactions involved .

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6. Write short notes on the following :

i. Carbylamine reaction

ii. Diazotisation

iii . Hofmann bromamide reaction

iv.Coupling reaction

v. Ammonolusis

iv. Acetylation

vii. gabriel phthalimide synthesis

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7. Accomplish the following conversions :

i. Nitrobenzene to benzoic acid ltbRgt ii. Benzone to m-bromophenol

iii. Benzoic acid to aniline ltbRgt iv. Aniline to 2,4,6, -tribromofluorobenzene ltbRgt v. Benxyl chloride to 2-phenylethanamine

iv. Chlorobenzen to p-bromoaniline

vii. Aniline to p-bromoaniline ltbRgt viii. Benzamide to toluene ltbRgt xi. Aniline to benzyl alcohol .

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8. Give the strutures of (A), (B) and (C) in the following reactions :

i. $CH_3CH_2I \xrightarrow{NaCN} (A) \xrightarrow[\text{Partial hydrolysis}]{OH} (B) \xrightarrow[+\ Br_2]{NaOH} (C)$

i. `

ii. $C_6H_5N_2CI \xrightarrow{CuCN} (A) \xrightarrow{H_2O/H^+} (B) \xrightarrow[\Delta]{NH_3} (C)$

iii. $CH_3CH_2Br \xrightarrow{KCN} (A) \xrightarrow{LiAlH_4} (B) \xrightarrow[0^\circ C]{HNO_2} (C)$

iv. $C_6H_5NO_2 \xrightarrow{Fe/HCI} (A) \xrightarrow[273K]{NaNO_2+HCI} (B) \xrightarrow[\Delta]{H_2O/H^+} (C)$

v. $CH_3COOH \xrightarrow[\Delta]{NH_3} (A) \xrightarrow{NaOBr} (B) \xrightarrow{NaNO_2/HCI} (C)$

vi. $C_6H_5NO_2 \xrightarrow{Fe/HCI} (A) \xrightarrow[273K]{HNO_2} (B) \xrightarrow{C_6H_5OH} (C)$

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9. An aromatic compound (A) on teratment with aqueous ammonia and heating frms compound (B) which on heating with Br_2 and KOH froms a compound (C) of the

molecular formula C_6H_7N. Write the struatures and $IUPAC$ names of compounds (A) . (B) and (C).

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10. Comlete the following reactions :

i.$C_2H_5NH_2 + CHCl_3 + Alc.\ KOH \rightarrow$

ii. $C_6H_5N_2Cl + H_3H_3PO_2 + H_2O \rightarrow$

iii. $C_6H_5NH_4 + H_2SO_4(Conc.\ ) \rightarrow$

iv. $C_6H_5H_2cl + C - H_5OH \rightarrow$

v. $C_6H_5NH_2Cl + C_2H_5OH \rightarrow$

vi. $C_6H_5NH_2 + Br_2(Aq.\ ) \rightarrow .$

vii $C_6H_5N_2Cl \xrightarrow[(ii)\ NaNO_2/Cu\ ,\ \Delta]{(i)\ HBF_4}$

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11. Why cannot be aromatic primary amines prepared by Gabriel phalimide synthesis ?

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12. Write the reaction of (i) aromatic and (ii) aliphatic promary amines with nitrous acid .

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13. Give plausible explanation for each of the following :

(i) Why are amines less acidic than alcohols of comparable molecular masses ?

(ii). Why do primary amines have higher boiling poings han

tertiary amines ?

iii. Why are aliphatic amines stroner bases than aromatic amines ?

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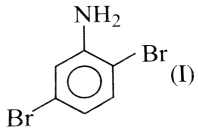
Exercises Linked Comprehension

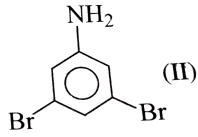
i. Organic compound (A) (Molar mass = 251) (Contains 63.7% of Br) —(i) Diazotisation; (ii) Na_2SnO_2→ Solid (B) (Contains 67.8% of Br) —Nitration→ One mono nitro compound

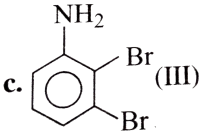
ii. Compound (C) [Isomer of (A)] —(i) Diazotisation; (ii) CuBr→ Compound (D) (Contains 76.4% of Br) —Nitration→ One mono nitro compound

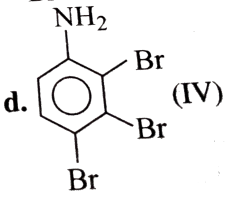
1. (i)

Compound (A) is:

A. a.  (I)

B. b.  (II)

C. c.  (III)

D. d. 

(IV)

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i. Organic compound (A) (Molar mass = 251) (Contains 63.7% of Br) —(i) Diazotisation; (ii) Na_2SnO_2→ Solid (B) (Contains 67.8% of Br) —Nitration→ One mono nitro compound

ii. Compound (C) [Isomer of (A)] —(i) Diazotisation; (ii) CuBr→ Compound (D) (Contains 76.4% of Br) —Nitration→ One mono nitro compound

2. (i)

(ii)

Compound (C) is:

A. (I)

B. (II)

C. (III)

D. (IV)

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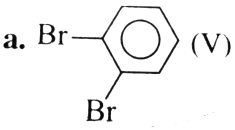
i. Organic compound (A) (Molar mass = 251) (Contains 63.7% of Br) —(i) Diazotisation, (ii) Na_2SnO_2→ Solid (B) (Contains 67.8% of Br) —Nitration→ One mono nitro compound

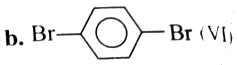
ii. Compound (C) [Isomer of (A)] —(i) Diazotisation, (ii) CuBr→ Compound (D) (Contains 76.4% of Br) —Nitration→ One mono nitro compound

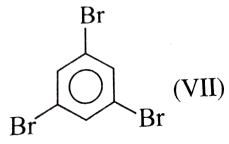
3. (i)

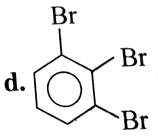
(ii)

Compound (B) is:

A. a.  (V)

B. b.  (VI)

C. c.  (VII)

D. d.  (VIII)

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i. Organic compound (A) (Molar mass = 251) (Contains 63.7% of Br) $\xrightarrow[\text{(ii) } Na_2SnO_2]{\text{(i) Diazotisation}}$ Solid (B) (Contains 67.8% of Br) $\xrightarrow{\text{Nitration}}$ One mono nitro compound

ii. Compound (C) [Isomer of (A)] $\xrightarrow[\text{(ii) CuBr}]{\text{(i) Diazotisation}}$ Compound (D) (Contains 76.4% of Br) $\xrightarrow{\text{Nitration}}$ One mono nitro compound

4. (i)

(ii)

Compound (D) is:

A. (V)

B. (VI)

C. (VII)

D. (VIII)

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5. An amino acid reacts with $10ml0.05MNaOH$ and the final solution has$pH = 2.30$ When$20ml$ of these base is added in the resulting solution.The pH become9.7.Identify the amino acid and calculate the isoelectric point of the amino acid.This amino acid is prepared by the reaction of compound $(X)$with $NH_3$and further hydrolysis with HCN

compound (X) is less Catom containing compound that gives postitive iodoform test and positive Fehling's solution test.

Amino acid is:

A. $H_3C - CH_2 - \underset{\underset{NH_2}{|}}{CH} - COOH$

B. $H_3C - \underset{\underset{NH_2}{|}}{CH} - COOH$

C. $H_3C - \underset{\underset{NH_2}{|}}{CH} - CH_2 - COOH$

D. $H_2N - CH_2 - CH_2 - COOH$

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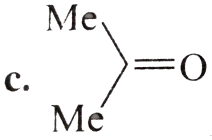
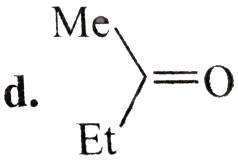
6. An amino acid reacts with $10ml 0.05M NaOH$ and the final solution has $pH = 2.30$ When $20ml$ of these base is added in the resulting solution.The pH become 9.7.Identify the amino acid and calculate the isoelectric point of the amino acid.This amino acid is prepared by the reaction of compound (X) with NH_3 and further hydrolysis with HCN compound (X) is less C atom containing compound that gives postitive iodoform test and positive Fehling's solution test.

Compound (X) is:

A. CH_3CHO

B. CH_3CH_2CHO

C. 

D. d. 

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7. An amino acid reacts with $10ml 0.05M NaOH$ and the final solution has $pH = 2.30$ When $20ml$ of these base is added in the resulting solution.The pH become 9.7.Identify the amino acid and calculate the isoelectric point of the amino acid.This amino acid is prepared by the reaction of compound (X) with NH_3 and further hydrolysis with HCN compound (X) is less C atom containing compound that gives postitive iodoform test and positive Fehling's

solution test.

Isoelectric point of the amino acid is:

A. $pH = 7.0$

B. $pH = 8.0$

C. $pH = 6.0$

D. $pH = 9.0$

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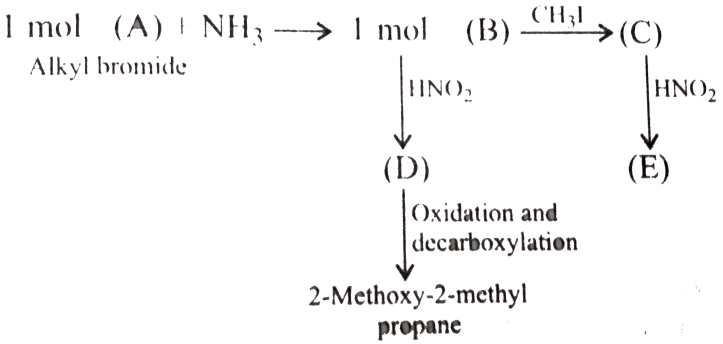

8.

Compound (A) is:

A. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{OCH_3}{|}}{C}} - CH_2CH_2Br$

B. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - \underset{\underset{OCH_3}{|}}{CH} - CH_2Br$

C. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - \underset{\underset{OCH_3}{|}}{CH} - Br$

D. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{OCH_3}{|}}{C}} - \underset{\underset{Br}{|}}{CH} - CH_3$

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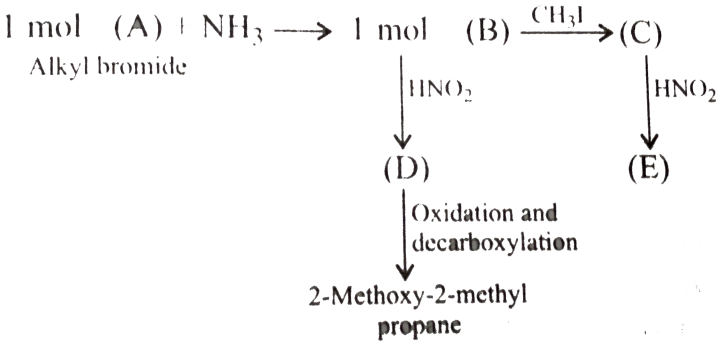

9.

Compound (B) is:

A. $CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle OCH_3}{\overset{|}{\underset{|}{C}}}} - CH_2CH_2NH_2$

B. $CH_3 - \underset{\displaystyle CH_3}{\overset{|}{CH}} - \underset{\displaystyle OCH_3}{\overset{|}{CH}} - CH_2Br$

C. $CH_3 - \underset{\displaystyle CH_3}{\overset{|}{CH}} - CH_2 - \underset{\displaystyle OCH_3}{\overset{|}{CH}} - NH_2$

D. $CH_2 - \underset{\displaystyle CH_3}{\overset{\displaystyle OCH_3}{\overset{|}{\underset{|}{C}}}} - \underset{\displaystyle NH_2}{\overset{|}{CH}} - CH_3$

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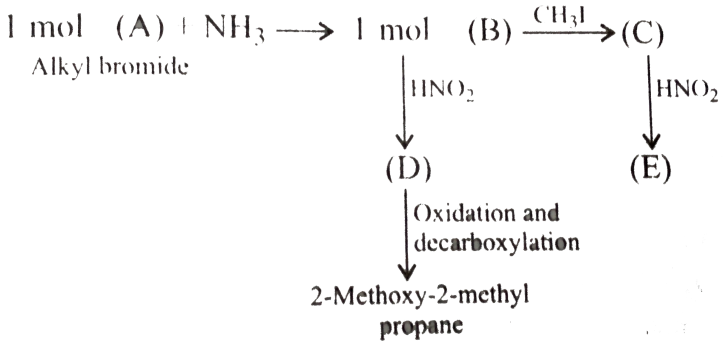

10.

Compound (C) is:

A. $CH_3 - \underset{\substack{CH_3 \\ OCH_3}}{CH} - \underset{OCH_3}{CH} - \underset{OCH_3}{CH} - CH_2NHCH_3$

B. $CH_3 - \underset{\substack{CH_3 \\ OCH_3}}{C} - CH_2CH_2NHCH_3$

C. $CH_3 - \underset{\substack{CH_3 \\ OCH_3}}{C} - \underset{NHCH_3}{CH} - CH_3$

D. $CH_3 - \underset{CH_3}{CH} - CH_2 - \underset{OCH_3}{CH} - NHCH_3$

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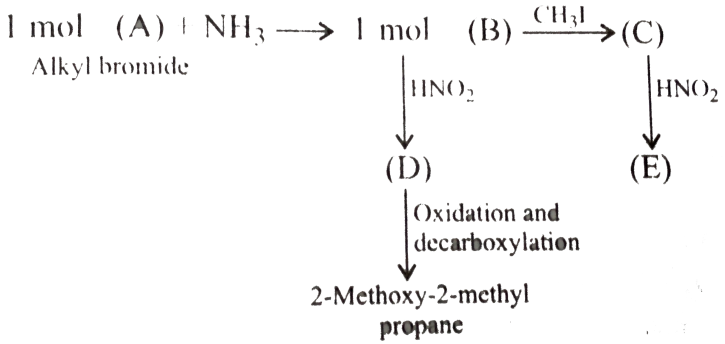

11.

Compound (D) is:

A. $CH_3 - \underset{\substack{CH_3 \\ OCH_3}}{CH} - \underset{OCH_3}{CH} - CH_2OH$

B. $CH_3 - \underset{CH_3}{\overset{OCH_3}{C}} - CH_2CH_2OH$

C. $CH_3 - \underset{\substack{CH_3 \\ OCH_3}}{CH} - CH_2 - \underset{OCH_3}{CHOH}$

D. $CH_3 - \underset{CH_3}{\overset{OCH_3}{C}} - \underset{OH}{CH} - CH_3$

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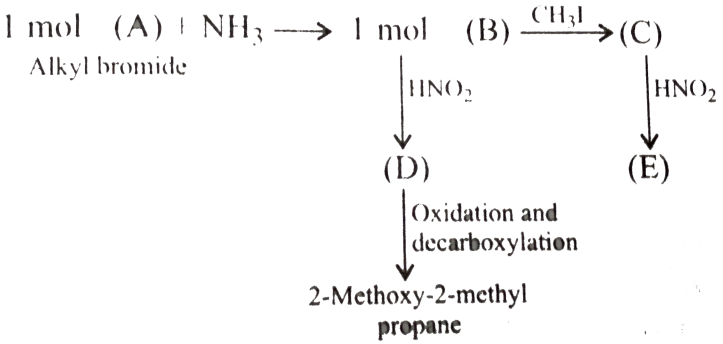

12.

Compound (E) is:

A. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{OCH_3}{\overset{|}{C}}} - CH_2 - CH_2 - \overset{CH_3}{\overset{|}{N}} - N = O$

B. $CH_3 - \underset{CH_3}{\overset{|}{CH}} - \underset{OCH_3}{\overset{|}{CH}} - CH_2 - \overset{CH_3}{\overset{|}{N}} - N = O$

C.

D. $CH_3 - \underset{CH_3}{\overset{|}{CH}} - CH_2 - \underset{OCH_3}{\overset{|}{CH}} - \overset{CH_3}{\overset{|}{N}} - N = O$

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13. $[A]$, $[B]$, $[C]$, $[D]$, $[E]$, $[F]$,and $[G]$ are amines,each of which forms a hydrochloride containing $32.42\ \%$ chloride. $[A]$, $[B]$, $[C]$and,$[D]$evoleN_2on reaction with HNO_2but $[E]$, $[F]$,and$[G]$donot.

Which of the following are1°amines?

A. (A), (B), (C), (D)

B. (E),(F)and(G)

C. All

D. None

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14. $[A]$, $[B]$, $[C]$, $[D]$, $[E]$, $[F]$,and $[G]$ are amines,each of which forms a hydrochloride containing $32.42\ \%$ chloride. $[A]$, $[B]$, $[C]$and,$[D]$evoleN_2on reaction with HNO_2but $[E]$, $[F]$,and$[G]$donot.

Which of the following are2° amines?

A. (A), (B), (C), (D)

B. (E),(F)and(G)

C. All

D. None

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15. $[A]$, $[B]$, $[C]$, $[D]$, $[E]$, $[F]$,and $[G]$ are amines,each of which forms a hydrochloride containing $32.42\ \%$ chloride. $[A]$, $[B]$, $[C]$and,$[D]$evoleN_2on reaction with HNO_2but $[E]$, $[F]$,and$[G]$donot.

If all the amines aree represented by the formula $R - NH_2$, the value of R in all the amines is:

A. C_3H_7 _

B. C_4H_9 _

C. C_5H_{11} _

D. C_2H_5 _

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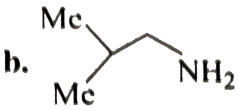
16. $[A]$, $[B]$, $[C]$, $[D]$, $[E]$, $[F]$,and $[G]$ are amines,each of which forms a hydrochloride containing $32.42\,\%$ chloride. $[A]$, $[B]$, $[C]$and,$[D]$evoleN_2on reaction with HNO_2but $[E]$, $[F]$,and$[G]$donot.

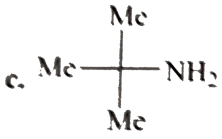
Which of the following does not represent the structure of (A),(B),(C), and (D)?

A.

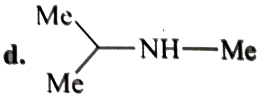
B.



C.



D.



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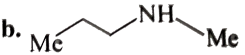
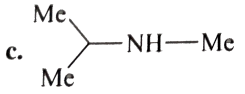
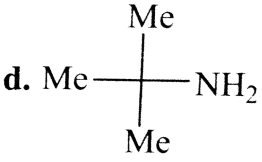
17. $[A]$, $[b]$, $[C]$, $[D]$, $[E]$, $[F]$,and[G] are amines,each of which forms a hydrochloride containing $32.42\,\%$ chloride. $[A]$, $[B]$, $[C]$and,[D]evoleN_2on reaction with HNO_2but [E], [F],and[G]`do not.

Which of the following does not represent the structure of (E),)F), and (G)?

A. a. 

B. b. 

C. c. 

D. d. 

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18. $[A]$, $[b]$, $[C]$, $[D]$, $[E]$, $[F]$,and[G] are amines,each of which forms a hydrochloride containing $32.42\,\%$ chloride. $[A]$, $[B]$, $[C]$and,[D]evoleN_2on reaction with HNO_2but [E], [F],and[G]

$do\neg.\,Whichofthefollow \in ggivesalcohol$ and $evolves$ N_(2)` gas?

A. a. Me NH Me

B. b. Me NH Me

C. c. Me, Me, NH—Me

D. d. Me, NH_2, Me

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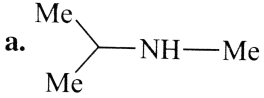
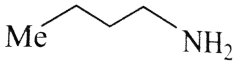
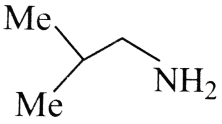
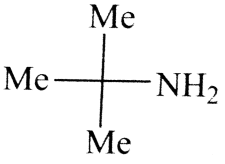
19. $[A]$, $[b]$, $[C]$, $[D]$, $[E]$, $[F]$,and[G] are amines,each of which forms a hydrochloride containing $32.42\,\%$ chloride. $[A]$, $[B]$, $[C]$and,[D]evoleN_2on reaction with HNO_2but [E], [F],and[G]`donot.

A. a. 

B. b. 

C. c. 

D. d. 

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20. A substance(X) contains $41.37\,\%\,C, 6.89\,\%\,H$.$0.166gm$ of (X) gaveNH_3 which was absorbed in$50ml$ of $N/10H_2SO_4$.The excess of acid required $30ml$of $N/10NaOH$ for neutralisation.(X)on treatment withHNO_2gave succinc acid (X)on heating lost NH_3 to give(A).(A) reacts with$Br_2$and $NAOH$ to give(B) containing $41.02\,\%\,C, 5.88\,\%\,H,$ and $11.96\,\%\,N.$ (B)on further treatment with$Br_2$and $NaOH$gives (C)(3-amino propanoic acid).(C)reats withNHO_2 to give β-hydroxy-propanoic acid.

Percentage of N is (X) is:

A. $34.38\ \%$

B. $24.38\ \%$

C. $14.38\ \%$

D. $44.48\ \%$

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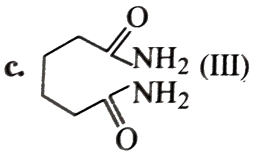
21. A substance(X) contains $41.37\ \%\ C$, $6.89\ \%\ H$.$0.166gm$ of (X) gaveNH_3 which was absorbed in$50ml$ of $N/10H_2SO_4$.The excess of acid required $30ml$of $N/10NaOH$ for neutralisation.(X)on treatment with HNO_2gave succinc acid (X)on heating lostNH_3 to give(A).(A) reacts with$Br_2$and $NAOH$ to give(B)

containing $41.02\,\%\,C, 5.88\,\%\,H,$ and $11.96\,\%\,N.\,(B)$on further treatment with$Br_2$and $NaOH$gives (C)(3-amino propanoic acid).(C)reats withNHO_2 to give β-hydroxy-propanoic acid.

Compound (X) is:

A. ` (##KSV_CHM_ORG_P2_C15_E01_056_O01.png" width="30%">

B. ` (##KSV_CHM_ORG_P2_C15_E01_056_O02.png" width="30%">

C. 

D. ` (##KSV_CHM_ORG_P2_C15_E01_056_O04.png" width="30%">

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22. A substance(X) contains $41.37\,\%\,C, 6.89\,\%\,H.0.166gm$ of (X) gaveNH_3 which was absorbed in$50ml$ of $N/10H_2SO_4$.The excess of acid required $30ml$of $N/10NaOH$ for neutralisation.(X)on treatment withHNO_2gave succinc acid (X)on heating lost NH_3 to give(A).(A) reacts with$Br_2$and $NAOH$ to give(B) containing $41.02\,\%\,C, 5.88\,\%\,H,$ and $11.96\,\%\,N.\,(B)$on further treatment with$Br_2$and $NaOH$gives (C)(3-amino propanoic acid).(C)reats withNHO_2 to give β-hydroxy-propanoic acid.

Compound (A) is:

A. (I)

B. (II)

C. (III)

D. (IV)

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23. A substance(X) contains $41.37\,\%\,C, 6.89\,\%\,H.0.166gm$ of (X) gaveNH_3 which was absorbed in$50ml$ of $N/10H_2SO_4$.The excess of acid required $30ml$of $N/10NaOH$ for neutralisation.(X)on treatment withHNO_2gave succinc acid (X)on heating lost NH_3 to give(A).(A) reacts with$Br_2$and $NAOH$ to give(B) containing $41.02\,\%\,C, 5.88\,\%\,H,$ and $11.96\,\%\,N.\,(B)$on further treatment with$Br_2$and $NaOH$gives (C)(3-amino

propanoic acid).(C)reats with NHO_2 to give β-hydroxy-propanoic acid.

Compound (B) is:

A. ` (##KSV_CHM_ORG_P2_C15_E01_058_O01.png" width="30%">

B. ` (##KSV_CHM_ORG_P2_C15_E01_058_O01.png" width="30%">

C. ` (##KSV_CHM_ORG_P2_C15_E01_058_O03.png" width="30%">

D. ` (##KSV_CHM_ORG_P2_C15_E01_058_O04.png" width="30%">

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24. A substance(X) contains $41.37\,\%\,C$, $6.89\,\%\,H$.$0.166gm$ of (X) gaveNH_3 which was absorbed in$50ml$ of $N/10H_2SO_4$.The excess of acid required $30ml$of $N/10NaOH$ for neutralisation.(X)on treatment withHNO_2gave succinc acid (X)on heating lost NH_3 to give(A).(A) reacts with$Br_2$and $NAOH$ to give(B) containing $41.02\,\%\,C$, $5.88\,\%\,H$, and $11.96\,\%\,N$. (B)on further treatment with$Br_2$and $NaOH$gives (C)(3-amino propanoic acid).(C)reats withNHO_2 to give β-hydroxy-propanoic acid.

Compound (C) is:

A. (V)

B. (VI)

C. (VII)

D. (VIII)

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25. A substance(X) contains $41.37\,\%\,C, 6.89\,\%\,H.0.166gm$ of (X) gaveNH_3 which was absorbed in$50ml$ of $N/10H_2SO_4$.The excess of acid required $30ml$of $N/10NaOH$ for neutralisation.(X)on treatment withHNO_2gave succinc acid (X)on heating lost NH_3 to give(A).(A) reacts with$Br_2$and $NAOH$ to give(B) containing $41.02\,\%\,C, 5.88\,\%\,H,$ and $11.96\,\%\,N.\,(B)$on further treatment with$Br_2$and $NaOH$gives (C)(3-amino propanoic acid).(C)reats withNHO_2 to give β-hydroxy-

propanoic acid.

The conversion of (B) to (C) is called:

A. Hofmann ammonolysis

B. Hofmann bromanid degradation

C. Lassen rearrangement

D. Curtius rearrangement

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Exercises Multiple Correct

1. Which statements are correct ?

A. Phenol and aniline give coupling reaction with diazonium salt.

B. Phenol couples with diazonium salt in mild basic conditions $(pH = 8 - 10)$.

C. Aniline couples with diazonium salt in mild acidic condition $(pH = 4 - 6)$.

D. Both phenol and aniline couple with diazonium salt in neutral condition $(pH = 7)$.

Answer: A::B::C

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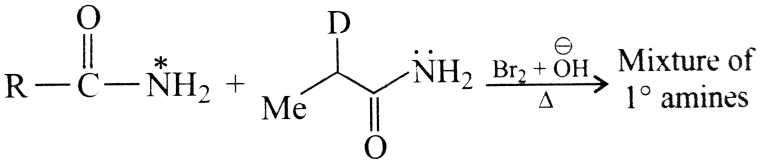
2. Which statements are correct about the reaction?



A. A mixture of two amines is formed, which suggests that rerrangement is intramolecular.

B. If R is chiral, it migrates with retention of configuration.

C. A mixture of four different amines is formed , which suggests that a free acyl nitrene $\left[R-\overset{O}{\overset{||}{C}}-\ddot{N}:\right]$ intermediate is formed.

D. A mixture of two different amines and a free acyl nitrene intermediate is formed.

Answer: A::B

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3. Which of the following statement are correct?

A. α-Amino acids on heating give piperazine (cyclic diamide).

B. β-Amino acids on heating give α, β-unsaturated acids.

C. $\gamma -$ Amino acids on heating give lactam (five-membered cyclic ester).

D. δ-Amino acids on heating give lactam (six-membered cyclic ester).

Answer: A::B::C::D

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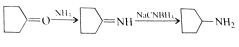
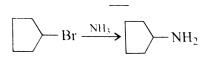
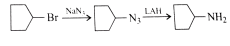
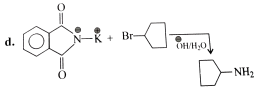
4. Which of the following statement are correct reactions?

A. 

B. 

C. 

D. 

Answer: A::B::C

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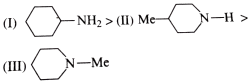
5. What of the following statements are correect?

A. The extent of H-bonding is greater in 1° than 2° and 3° amines.

B. The boiling points of isomeric amines are in the order:

$1^{\circ} > 2^{\circ} > 3^{\circ}$.

C. The boiling points of



D. The boiling points of

$$(I)C_4H_9NH_2 > (II)Me_2N - Et > (III)(C_2H_5)_2NH$$

.

Answer: C::D

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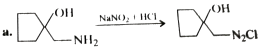
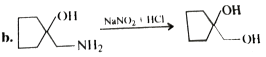
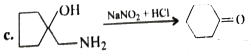
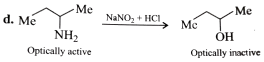
6. Which of the following reaction are correct?

A. 

B. 

C. 

D. 

Answer: A::C::D

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7. Which of the following statement are correct?

A. In gas phase, the basic character of amine is $3^\circ > 2^\circ > 1^\circ$, Due to the $+I$ effect $(R-)$, the availability of $\bar{LP}e's$ pm N increases.

B. In aqueous medium, the basic characterof amines is $Me_2NH > ME_3N > MeNH_2 > NH_3$.

C. In aqueoys medium, the addition of protons increases of crowding and thus strains setup, which being the highest in 3° amine decreases its basic character.

D. In aqueous medium, the ammonium ions in solution are stabilised not only by alkyl groups but also by H-bond donation to the solvent.

Answer: A::C::D

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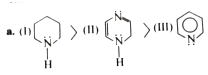
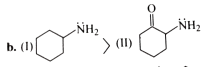
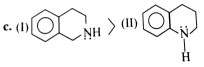
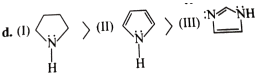
8. Which of the following are the correct orders of basic character?

A. 

B. 

C. 

D. 

Answer: A::B::C

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9. Which statements are correct about MIC (methyl isocyanate, $Me - N = C = O$).

A. MIC is prepared byt the reaction of $MeNH_2$ and $COCl_2$ (phosgene).

B. Hydrolysis of MIC gives $\left(Me - NH - \overset{O}{\overset{||}{C}} - OH \right)$ as the intermediate, which gives $MeNH_2$ and CO_2 on further hydrolysis.

C. MIC is used to prepare insecticide, carbaryl under the commercial name Sevin.

D. **d.** $\left(\overset{\curvearrowleft}{N} = C \right)$, bond takes part when 1-naphthol is reacted with MIC beacause N is more basic and nucleophilic.

Answer: A::B::C::D

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10. Which of the following statements are correct?

A. Aryldiazonium ions are more stable than alkyldiazonium ions.

B. Electron release from the ortho-and para-positions of the ring stabilises the aryldiazonium ion.

C. The increased stability of aryldiazonium is due to the great difficuly of forming $Ar^{\oplus}$ as compared to $R^{\oplus}$.

D. Alkyldiazonium is more stable than aryldiazonium ion.

Answer: A::B::C

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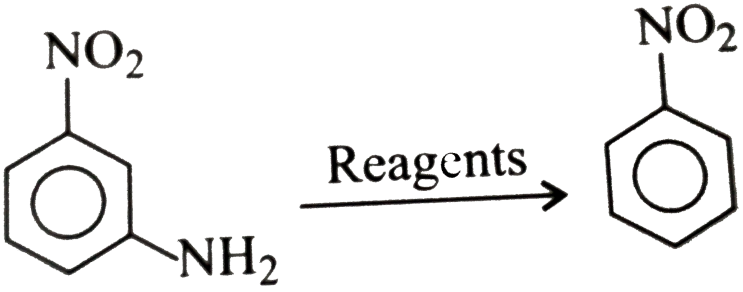
11. Which of the following reagents are correct for the given reaction?



A. (i) $NaNO_2 + HCl, 0 - 5^\circ C$, (ii) H_3PO_2

B. (i) $KNO_2 + HBr, 0 - 5^\circ C$, (ii) $Na_2SnO(2)$

C. (i) HNO_2, (ii) C_2H_5OH and heat

D. (i) $KNO_2 + HCl$, (ii) H_2O (Steam)

Answer: A::B::C

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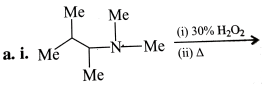
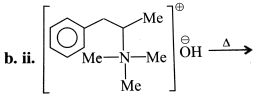
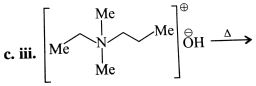
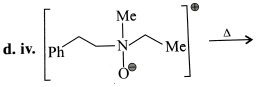
12. Which of the following would give Hofmann alkene?

A. 

B. 

C. 

D. 

Answer: A::C

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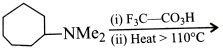
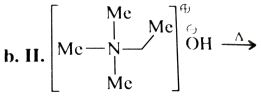
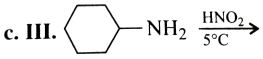
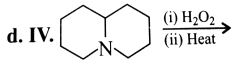
13. Which of the following are Cope reactions?

A. 

B. b. II. 

C. c. III. 

D. d. IV. 

Answer: A::D

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14. Which of the following statements are correct?

A. $CH_3\overset{\oplus}{N} \equiv \overset{\Theta}{C}$ on partial hydrolysis gives N-methyl methanamide.

B. $CH_3\overset{\oplus}{N} \equiv \overset{\ominus}{C}$ on partial hydrolysis gives CH_3NH_2 and $HCOOH$.

C. In an isocyanide, first an electrophile and then a nucleoplile add at the same C atom bearing negative charge.

D. In an isocyanide, first a nucleophile and then an electrophile add at the same C atom bearing negative charge.

Answer: A::B::C

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15. Which of the following statements are correct?

A. Ethanenitrile on partial hydrolysis gives acetamide.

B. Ethanenitrile on complete hydrolysis gives acetic acid and NH_3.

C. Cyanides are hydrolysed with aqueous mineral acids or alkali.

D. Isocyanides are hydrolysed with dilute acids and not by alkali.

Answer: A::B::C::D

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16. By which of the following reactions can MIC (methyl isocyante) be obtained?

A. $CH_3 - \overset{\oplus}{N} \equiv \overset{\ominus}{C} + HgO \rightarrow$

B. $CH_3 - \overset{\oplus}{N} \equiv \overset{\ominus}{C} + O_3 \rightarrow$

C. $CH_3 - \overset{\oplus}{N} \equiv \overset{\ominus}{C} + S \rightarrow$

D. $CH_3 - \overset{\oplus}{N} \equiv \overset{\ominus}{C} + DMSO \rightarrow$

Answer: A::C::D

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17. Which of the following statements are correct?

A. $1^\circ, 2^\circ,$ and 3° nitro compounds can be distinguished by HNO_2.

B. 1° nitro compound with $HNO(2)$ gives nitrolic acid, which gives blood-red colour with base.

C. 2° nitro compound with HNO_2 gives pseudo nitrole, which gives blue colour with base.

D. 3° nitro compound does not react with HNO_2.

Answer: A::B::C::D

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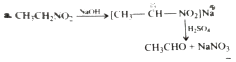
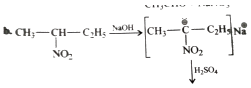
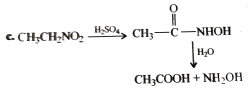
18. Which of the following reaction are correct?

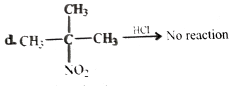
A.



B.



C. 

D. 

Answer: A::B::C::D

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19. Which of the following reaction is/ are correct?

A. $PhNO_2 \xrightarrow{LAH} PhNH_2$

B. $PhNO_2 \xrightarrow[+NaOH]{NaSnO_2} Ph-N=N-Ph$

C. $PhNO_2 \xrightarrow{Na_3AsO_3+NaOH} Ph-\overset{\oplus}{\underset{\cdot\,|}{N}}=N-Ph$ (with $O^{\ominus}$)

D. $PhNO_2 \xrightarrow{Al-Hg/H_2O} Ph-NH-NH-Ph$

Answer: B::C

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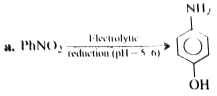
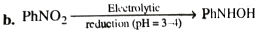
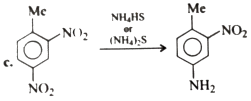
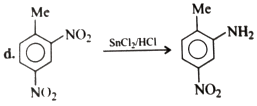
20. Which of the following reaction are wrong?

A. 

B. 

C. 

D. 

Answer: A::B

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Exercises Single Correct

1. Which of the following substaces on treatment with P_2O_5 gives ethanenitrile?

A. Propanamide

B. Enthanamide

C. Ethanoic acid

D. N-Methylethyl amine

Answer: B

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2. Methyl cyanide on treatment with methyl magnesium bromide followed by of subsequent hydrolysis gives:

A. Propanone

B. Ethanone

C. Ethanal

D. Propanal

Answer: A

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3. The product formed by the treatment of ethanol and ethane nitrile in the presence of sulphuric acid is:

A. Ethyl acetate

B. Diethyl ether

C. Ethyl methyl ketone

D. Butanal

Answer: A

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4. Which of the following reagents on treatment with benzenamine in basic medium produces phynyl isocyanide?

A. CCl_4

B. Trichloromethane

C. Methylene dichloride

D. Hexachloroethane

Answer: B

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5. Which of the following is not an ambident nucleophile?

A. $NO_2^{\ominus}$

B. $\overset{\ominus}{O}H$

C. $CSN^{\ominus}$

D. $CN^{\ominus}$

Answer: B

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6. (A) is subjected to reduction with $Zn-(Hg/HCl)$ and the product formed is N-methylmethanamine. (A) can be.

A. Ethane nitrile

B. Nitroethane

C. Carbylaminoethane

D. carbylaminomethane

Answer: D

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7. Mendius reaction involves the:

A. Reduction of aldehydes to give alcohols

B. Reduction of nitriles with sodium and ethanol

C. Oxidation of nitriles

D. Hydrolysis of cyanides.

Answer: B

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8. The reaction of primary amine with chloroform and ethanolic solution of KOH is called:

A. Hofmann reaction

B. Reimer-Tiemann reaction

C. Carbylamine reaction

D. Kolbe reaction

Answer: C

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9. Ethanamine is treated with nitrous acid at ordinary temperature, the products will be:

A. Ethanol only

B. ethanol acetic acid, N_2, and H_2O

C. Acetic acid, ethane, and H_2O

D. Ethanol, ethene, N_2 andH_2O

Answer: D

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10. Stephen's reduction converts nitriles into:

A. Aldehydes

B. Ketones

C. Amines

D. Carboxylic acids

Answer: A

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11. When propane is subjected to the treatment with fuming nitric acid at 673 K which of the following will not

form ?

A. 1-Nitropropane

B. 2-Nitropropane

C. Nitromethane

D. Nitrohexane

Answer: D

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12. Nitrobenzene is subjected to reduction with zinc dust and ammonium chloride. The main product formed will be:

A. Benzenamine

B. Aniline

C. N-Phenylhydroxylamine

D. None of these

Answer: C

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13. A primary nitroalkane is treated with nitrous acid,which of the following will be the main product?

A. Pseudonitrol

B. Nitrolic acid

C. A primary amine

D. Primary alcohol

Answer: B

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14. Nitromethane is subjected to treatment with chlorine in the presence of sodium hydroxide, the main product is:

A. Monochloronitromethane

B. Trichloromethane

C. Chloropicrin

D. None of the above

Answer: C

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15. Which of the following nitro compounds will show tautomerism?

A. $C_6H_5NO_2$

B. $(CH_3)_3CNO_2$

C. $CH_3CH_2NO_2$

D. None of the above

Answer: C

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16. Which of the following groups will facilitate the electrophilic attackon benzene ring?

A. $-NO_2$

B. $-CHO$

C. $-Cl$

D. $-SO_3H$

Answer: C

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17. Gabriel synthesis is used for the preparation of

A. 1° amine

B. 2° amine

C. 3° amine

D. all can be prepared

Answer: A

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18. Hinsberg's reagent is:

A. C_6H_5COCl

B. CH_3COCl

C. $C_6H_5CH_2Cl$

D. $C_6H_5SO_2Cl$

Answer: D

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19. Which of the following statements is correct?

A. Methyl amine is slighty acidic.

B. Methyl amine is less basic than ammonia.

C. Methyl amine is less basic than dimethyl amine.

D. Methyl amine is less basic than aniline.

Answer: C

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20. Which of the following amines will form stable doazonium salt at $273 - 283K$?

A. $C_2H_5NH_2$

B. $C_6H_5NH_2$

C. $C_6H_5CH_2NH_2$

D. $C_6H_5N(CH_3)_2$

Answer: B

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21. Which of fllowing is the weakest base ?

A. NH_3

B. $C_6H_5NH_2$

C. $C_6H_5CH_6NH_2$

D. CH_3NH_2

Answer: B

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22. Which of the following are not functional isomers of each other ?

A. $CH_3CH_2NO_2$ and $CH_3CH_2ON = O$

B. C_2H_5CHO and CH_3COCH_3

C. $CH_3CH - 2CH_2$ and $CH_{30} \_ 2cHNH_2$

D. $C_3H_7NH_2$ and $(CH_3)_2CHNH_2$

Answer: D

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23. A nitrogenous substamnce (X) is treated with HNO_2 and the product so formed is further treate with $NaOH$ solution , which produces blue coloruation . Which of the following can (X) be ?

A. $CH_3CH_2NH_2$

B. $CH_3CH_2NO_2$

C. CH_3CH_2ONO

D. $(CH_3)_2CHNO_2$

Answer: D

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24. Which of the following cannot react with HNO_2?

A. CH_3CONH_2

B. $(CH_3)_3CNO_2$

C. $(CH_3CH_2)_2NH$

D. $CH_3CH_2NH_2$

Answer: B

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25. Nitrobenzene on eelctrolutic reduction gies :.

A. Azobebzene

B. Hydrazobebzene

C. Aminophenol

D. Aniline

Answer: D

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26. An orgnic compoud with the formula C_3H_5N hydrolysis forms a acid which reduces Fehling solution . The compound can be :

A. Ethanenitrile

B. Isocyanoethane

C. Ethoxyethane

D. Propanenitrile

Answer: B

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27. In order to distinguigh between $C_2H_5NH_2$ and $C_6H_5NH_2$ which of the following reagenis is useful ?

A. Hinsberg reagent

B. p-Naphatheol

C. Benzene diazomium chloride

D. None of the above

Answer: B

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28. The compound 1- (N-ethyl-N-methyl)- propanamine forms non-superimposable mirror images . But this compound does not show optical activity because of the :

A. Absence fo a chiral (N) atom

B. Prersence of chiral (N) atom

C. Presence of lone pair on (N) atom

D. Rapid filipping of one form into the another

Answer: D

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29. Which of the following will yield phenlhydrazine hydrochloride ?

A. Benzenamine and hydrazine

B. Hydrazine and HCl

C. Benzenediazonium chlorid and $SnCl_2 / HCl$

D. Nitrobenzene and $SnCl_2 / HCl$

Answer: C

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30. Which of the following rooduces one mononitro and three isomeric dinitro derivatives ?

A. p-Xylene

B. ethyl benzene

C. o-Xylene

D. m-Xylene

Answer: A

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31. $CHl_3 \xrightarrow{HNO_3} (X)$ ltbRgt In the above sequence , (X) is :

A. Nitrochloromethane

B. Chloropicrin

C. Ethanenitrile

D. None of the above

Answer: B

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32. Which of the following is formed when RNH_2 reacts with $RCHO$?

A. Hemiacetals

B. Acetals

C. Ketals

D. Imines

Answer: D

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33. Which of the following represents the poinsonous gas which caused the tragedy in Bhopal in 1984 ?

A. $CH_3C = N = S$

B. $CH_3 - N = C = O$

C. $CH_3 - N = C = S$

D. $CH_3 - O - N = C$

Answer: B

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34. The conjugate base of $(CH_3)NH_2^{\oplus}$ is :

A. $(CH_3)_3N$

B. $(CH_3)_2NH$

C. $(CH_3CH_2)_2NH_2$

D. $C_6H_5NHCH_2$

Answer: B

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35. Which of the following is the weakest base ?

A. $(CH_3)_2NH$

B. $(CH_3)_3N$

C. $C_6H_5NH_2$

D. $(CH_3)_2N^{\oplus}$

Answer: C

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36. Which of the following reactions does not yield an amine?

A. $R - X + NH_3 \rightarrow$

B. $R - CH = NOH = [H] \xrightarrow[C_2H_5OH]{Na}$

C. $R - CN + H_2O \xrightarrow{H^{\oplus}}$

D. $R - CONH + 4[H] \xrightarrow{LiAlH_4}$

Answer: C

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37. Primary and secondary amines are distinguished by :

A. Br_2 / KOH

B. $HClO$

C. NHO_2

D. NH_3

Answer: C

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38. Indicate which nitrogen compound amonfst the following would undergo Hofmann reaction (i.e., reaction

with $Br-2$ and strong KOH) tom furmish the primary amine $(R-NH_2)$.

A. $RCONHCH_3$

B. $RCOONH_2$

C. $RCONH_2$

D. $R-CO-NHOH$

Answer: C

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39. Pick up the correct stament :

A. The boling points of alkly halides are more than those of the corresponding alkances .

B. In water , the solulity of $CH_3OH > C_2H_5OH > C - 6H_5OH.$

C. $C_6H_5NH_2$ is a weaker base thann NH_3.

D. All the above statements are correct .

Answer: D

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40. The producet of the reaction of alcoholic silver nitrite with ethyl bromide is :

A. Ethane nitrile

B. Ethene

C. Nitroethane

D. Ethyl alcohol

Answer: C

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41. The electrolytic reduction of nitrobenzene in strongly acidic medium produces .

A. Phenol

B. p-Aminophenol

C. Hydroazobenzen

D. Azohebzene

Answer: B

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42. Azoxybenzene can be obtained by the treatment of mitro-benzene with :

A. O_2

B. H_2 / Pt

C. $NaAsO_3 / NaOH$

D. $Zn / NaOH$

Answer: C

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43. Tertiary nitro compounds cannot show tautomerism becauses :

A. They are very stable .

B. They isomerise to give secondary intro compounds

C. They do not have labile hydrogen atom.

D. They are highly reactive .

Answer: C

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44. Diazo coupling is useful to prepare some :

A. Pesticides

B. Dyes

C. Proteins

D. Vitamins

Answer: B

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45. The following reaction constituts :

$$RNH_2 + S = C = S \xrightarrow[H_2S]{H_gCl_2} \underset{\text{Alkyl isothicoyanate}}{R - N = C = S} + H_2S$$

A. Mustaard ila reaction

B. Test for 3° amine

C. Test for 2° amine

D. Test for CS_2

Answer: A

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46. Primary , secondary , tertiary amines can be separated by the following except :

A. Fractional distillation

B. Fractional method ysubg duetgtk oxalate

C. Hinsberg' s method using $C_6H - 5SOCl$

D. Selective crtystallisation

Answer: D

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47. $1^{\circ}.2^{\circ}$. And 3° amines can be best distinguished by :

A. HNO_2 treatment `

B. Exthaustive alkylation

C. Mustard oil reaction

D. Carbylamine reaction

Answer: A

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48. When $C_6H_5N_2Cl$ is reduced with Na_2SnOO_2, the product is :

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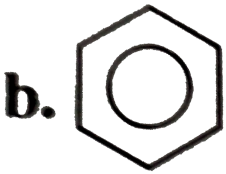
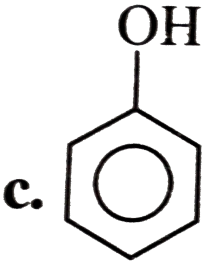
B. 

C. 

D.

Answer: B

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49. Nitrogen is likely to be evolved when $NaNO_2$ in dilute HCl warmed with :

A. $CH_3NHCH_2CH_3$

B. $(C_2H_5)_3N$

C. $C_6H_5NH_2$

D. $H_2NCH_2CH_2NH_2$

Answer: D

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50. When $PhNO_2$ is reduced in alkaline medium , the product is

A. $Ph - \overset{\overset{O}{\uparrow}}{N} = N - N - PH$ (Azoxy-benzene)

B. $Ph - N = N - Ph$(Azohenzene)

C. $Ph - NH - NH - Ph$ (Hydrazobenzene)

D. All

Answer: D

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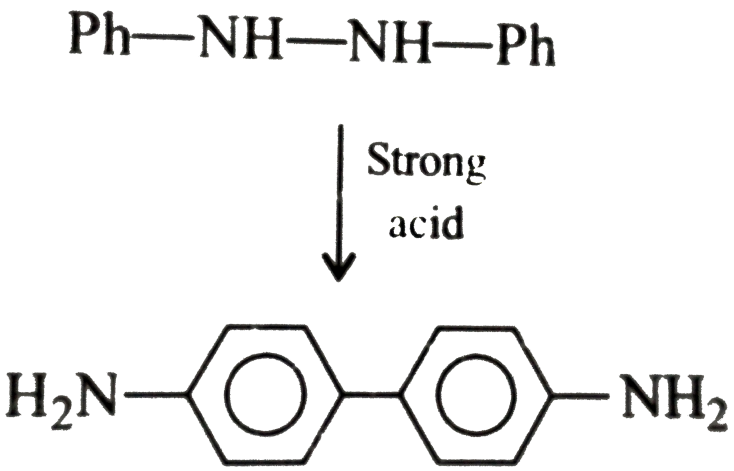
51. The following reaction is



A. Benzidine rearrangement

B. Pinacol-Pinacolone rearrangement

C. Fries rearrangement

D. Benzil-benzilic acid arrangement

Answer: A

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52. A compound (X) has the molecular formula C_7H_7O . On treatment with Br_2 and KOH. (X) gives an amine (Y) , (Y) gives carbylamine lest . (Y) upon diazotisation and couupling with phenol gives an azodye (Z) .(X) is :

A. $PhCONH_2$

B. $PhCONHCOCH_3$

C. $PhNO_2$

D. $PhCOONH_4$

Answer: A

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53. A compound (X) has the molecular formula C_3H_7NO . With Br_2 and KOH, (X) gives (Y) . (Y) responds to mustard oil reaction . (Y) upon treatment with HNO_2 evolves N_2 and gives an alcohol (Z) which gives iodoform test , (X) is likelty to be :

A. $C_2H_5CONH_2$

B. CH_3COHH_2

C. CH_3COONH_4

D. C_2H_5CNO

Answer: A

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54. An amine on treatment with HNO_2 evolved N_2 The amine on exhaustive methylation with CH_3I formed a quatermary dalt containing $95.07\,\%$ iodine . The amine is likely to be:

A. CH_3NH_2

B. $(CH_3)_2NH$

C. $C_2H_5NH_2$

D. $(CH_3)_3N$

Answer: C

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Exercises Assertion And Reasoning

1. Assertion(A) : Aniline hydrogen sulphate on heating froms a mixture of o- and p-amineo- sulphonic acid .

Reason (R) : The suphonic acid is `overline e withdrawing .

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: B

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2. Assertion (A) : $Ph\overset{\oplus}{N}_2Br^{\ominus}$ couples with N, N-dimethyl aniline (I) but not with $2, 6$, -dimethyl-N, N-dimethuyl aniline (II)

Reason (R): Due to steric inhibition of resonce , the p-potion of (II) is not sufficiently activated fro the coupling reation.

Due to steric inhibition of resonamne, the p-position of (II) is not sufficiently activated for the coupling reaction.

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: A

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3. Assertion (A) : Gabriel phthalimide reaction is used for the prepartion fo $C_2H_5NH_2$ and p-nitro aniline .

Reason (R): SN^2 reaction takes place with $1^\circ RX$ and $1^\circ ArX$ containing $\bar{e}$- withdrawing group at o-and p-positions

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: A

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4. Assertion (A) : Pyridine is more basic than piperidine.

Reason (R): N atom is sp^2-hybridised in both.

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: D

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5. Assertion (A) : $Ph\overset{\oplus}{N}_2Br^{\ominus}$ is more acidic than NH_4Br.

Reason (R) : $Ph\overset{\oplus}{N}H_3$ (anilinum ion) is resonance stabilinsed .

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: C

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6. Assertion (A) : Carbylamine reaction takes place between 1° amine and $CHBrCII$ in basic medium . ltbRgt Reaspm (R): The reaction takes place by the formation of bromiodo carbene (:C BrI) as intemediate .

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: C

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7. Assertion (A) : Hofmann bromamide reaction takes place btween an arthide and Br_2 in basic medium . ltbRgt

Reason (R). The reaction proceeds by the formation of $\left(R-\overline{N}:\right)$ nitrene intremediate.

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: C

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8. Assettio (A) : $Ph\overset{\oplus}{N}_2Br^{\Theta}$ on reaction with $NaOH$ gives bebzene diazohroxile

Reason (R) : $\overset{\Theta}{O}H$ is a strong nucleophile , attacks the terminal (N) atom , and forms a covalent bond.

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: A

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9. Assettion (A) : $Ph\overset{\oplus}{N}_2Br^{\ominus}$ pm reactopm wotj motrpnemzeme om the [resemce pf $NaOH$ gives p-nitrbiphenyl

Reason(R) : The reaction takes jplace by free radical mechanism .

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: A

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10. Assettion (A) : Coupling of $Ph\overset{\oplus}{N}_2Br^{\Theta}$ with aniline is faster than with phenol.

Reason (R): Aniline is more $\bar{e}$ donating than phenol.

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: A

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Archives Single Correct

1. The compound which on reaction with aqueous nitrous acid at low tremperature produces an oily nitrosoamine is :

A. Methylamine

B. Ethylamine

C. Diethylamine

D. Triethgylamin

Answer: C

View Text Solution

2. Acetamide is reated separately with the following reagents . Which one of these would give methylamine ?

A. PCl_5

B. $Soda\ \lim e$

C. $NaOH + Br_2$

D. $Hotconc.\ H_2SO_4$

Answer: C

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3. Carbylamine test is performed in alc . KOH by heating a mixture of :

A. Choloroform and silver powder

B. Trihalogenated methane and a primary amine

C. An alkyl halide and a primary amine

D. An alkyl cyanide and a primary amine

Answer: B

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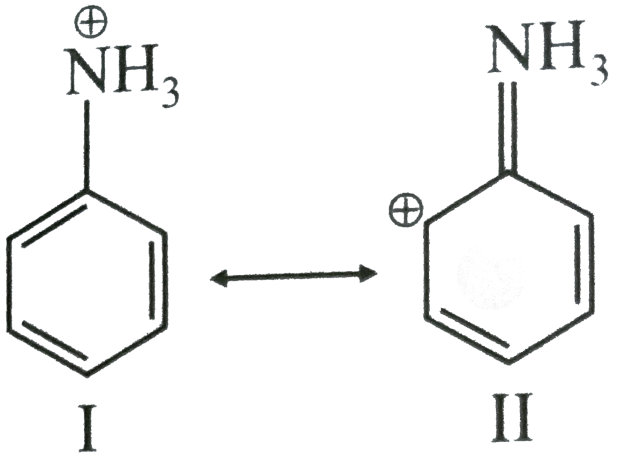

I II

4.

Examine the following two structures for the anilinium ion and choose the correct statement from the ones given below:

A. (II) is not an acceptabnle canonical structure because carbionium ions are less stable than ammonium ions

B. (II) is not an acceptable canonical structure becauses it is non -aromatic .

C. (II) is not an acceptable canonical structure becauses nitrogen has 10 valence eelctrons .

D. (II) is an acceptable canonical structure.

Answer: C

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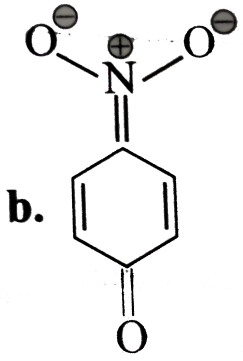
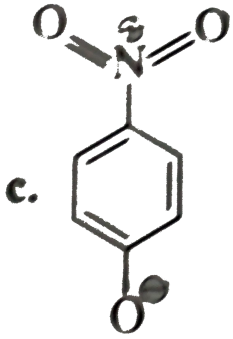
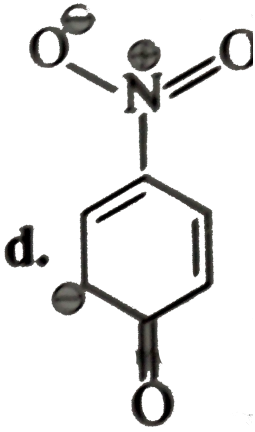
5. The most unlikely representation of resonance structures of p-nitrophenoxide ion is:

A. ` (##KSV_CHM_ORG_P2_C15_E01_150_O01.png" width="30%">

B. 

C. 

D. 

Answer: C

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6. Among the following the strongest base is

A. $C_6H_5NH_2$

B. $p - NO_2C_6H_4NH_2$

C. $m - NO_2.C_2H_4NH_2$

D. $C_6H_5CH_2NH_2$

Answer: D

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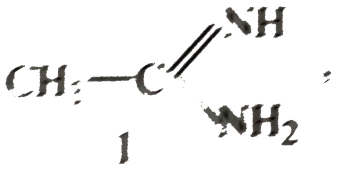
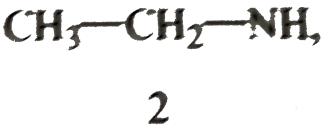
7. The correct order of basictiies of the following compounds is :



1



2

3. $(CH_3)_2NH$. 4. $CH_3 - \overset{O}{\overset{||}{C}} - NH_2$

A. $(2) > (1) > (3) > (4)$

B. $(1) > (3) > (2) > (4)$

C. $(3) > (1) > (2) > (4)$

D. $(1) > (2) > (3) > (4)$

Answer: B

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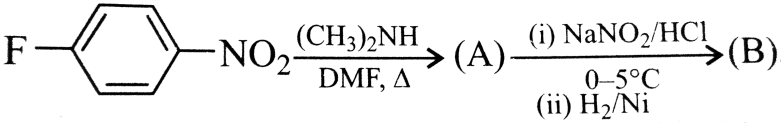
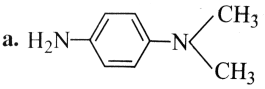
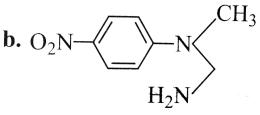
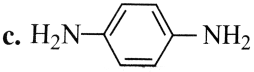
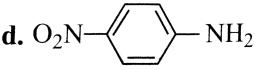
8. 

A. 

B. 

C. 

D. 

Answer: A

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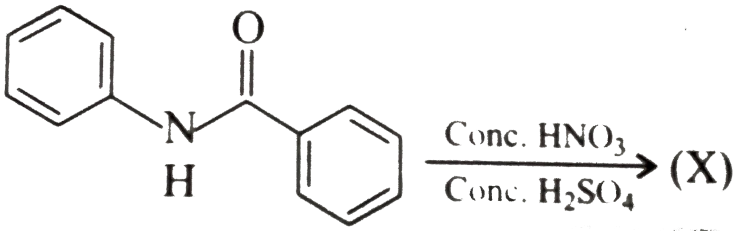
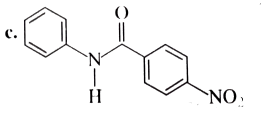
9. In the following reaction ,

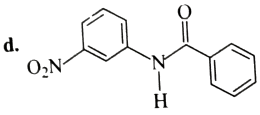


the structure of the major product (X) is :`

A. ` (##KSV_CHM_ORG_P2_C15_E01_154_O01.png" width="30%">

B. ` (##KSV_CHM_ORG_P2_C15_E01_154_O02.png" width="30%">

C. 

D. 

Answer: B

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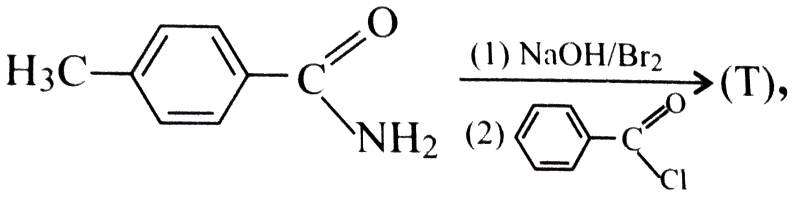
10. In the reaction

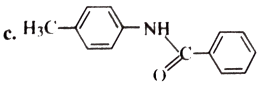


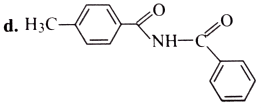
`

struture of the product (T) is :

A. ` (##KSV_CHM_ORG_P2_C15_E01_155_O01.png" width="30%">

B. ` (##KSV_CHM_ORG_P2_C15_E01_155_O02.png" width="30%">

C. 

D. 

Answer: C

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Archives Assertion-Reasoning

1. Statement I: In strongly acidic solutions , anline becomes more reactive towards electrophilic reagents ltbRgt Statement II: The amino group being completely protonated in strongly acidic solution, the line pair of electrons on nitrogen is no longer avalible for resonace.

A. Statement (I) is true : Statement (II) is true : Statement (II) is the correct esplanation of Statement (I)

B. Statement (I) is true : Statement (II) is true , Statement (II) is not the correct exphanation fo sTatement (I)

C. Statement I is True, Statament II is false

D. Statement (I) is false , Statement (II) is true .

Answer: (d)

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2. Statement I: Aniline on reaction with $NaNO_2HCl$ at $0^\circ C$ followed by coupling with β-naphthol gives a dark blue coloured precipitate.

Statement II: The colour of the compound formed in the

reaction of aniline with $NaNO_2 / HCl$ at $0^\circ C$ followed by coupling with β-naphthol is due to extended conjugation.

A. Statement (I) is true : Statement (II) is true : Statement (II) is the correct esplanation of Statement (I)

B. Statement (I) is true : Statement (II) is true , Statement (II) is not the correct exphanation fo sTatement (I)

C. Statement I is True, Statament II is false

D. Statement (I) is false , Statement (II) is true .

Answer: (d)

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Archives Multiple Correct

1. When nitrobezene is treated with Br_2 in the presence of $FeBr_2$ the major product formed is m-bromonitro-benzene . Statements which are related to obtatining the m-isomer are :

A. The electron densitty on meta-carbon is more than that on ortho-and para -positons

B. The intemediate carbonium ion formed after intial attakc of $Br^{\oplus}$ at the meta-position is least destabnilise

C. Loss of aromaticity when $Br^{\oplus}$ attacks at the orth- and para -positions and not at meta-position.

D. Easier loss of $H^{\oplus}$ to regain aromaticity from the meta-position than fromm the ortho- and para-positions

Answer: (a)

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2. p-Chloroaniline and anilinium hydrochloride can be distinguished by :

A. Sandmeyer reaction

B. $NaHCO_3$

C. $AgNIO_3$

D. Carbylamine test

Answer: (c)

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3. A positive carbylamine test is given by:

A. N,N-Dimethyl aniline

B. $2, 4 -$ Dimethyl aniline

C. N-methyl -o-methyl aniline

D. p-Methyl benzylamine

Answer: (b,d)

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Archives Fill In The Blanks

1. In an acidic medium ..... behaves as the strongest base (nitrobenzen. Aniline, phenol),

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2. Amongst the three ismers of nitrophenol , the one that is least soluble in water is .....

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3. The high melting point and insolubility of sulphanilic acid in organic solvents are due to its ..... structure .

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Archives Analytical And Descriptive

1. State the equations for the preparation of the following compounds . (Equations need not to be balance).

(i) Chlorobenzene from aniline (in two steps)

(ii) N-Propyl amine from ethyl chloride (in two steps)

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2. State the conditons under which the following preparatiojn in carried out . Give the necessary equyations which need not to be balance : Aniline from bensesn'

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3. How would you convert ?

'Aniline to chorobenzene' .

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4. For intromethane movecule , write structures (s) (i) showing signifcant resonance stabilisation (ii) indicationg tautomerism .

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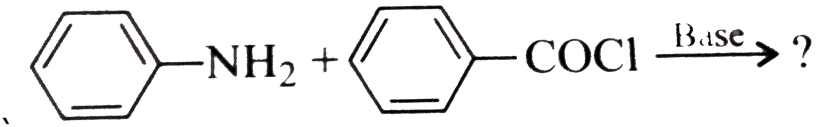
5. Complete the following with appropriate structures :



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6. Give a chemical test and the reagents used to distinguish between the following :

'Ethylamine and diethylamine'

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7. Arrange the following in increasing orde of base strength : methylamine, dimethylamine , aniline , N-methylamiline .

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8. How will you bring about the following conversion ?

$4-$ nitroaniline to $1, 2, 3$-tribromobensene

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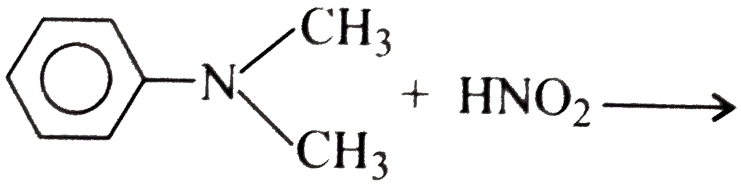
9. Write the structure of the major organci product expected from the following reaction .



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10. A basic volatile nitrogen compound give a foul smelling gas when treated with chaloroform and alcoholic potash. $A 0.295 gm$ sample of the substance dissolved in aqueous HCl and treated with $NaNO_2$ solution at $0^\circ C$ libreated a colourless , odorless gas whose volume corresponded to $112 ml$ at STP. After the evoltion fo the gas was complte , the aqueous solution was distilled to give an orgfanic liquid which did not coniain nitrogen and wihic on watemiing with alkali and iodine gave a uellow preciptitate , Idntify the orginal substance assuming that it contains one (N) atom per molecule .

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11. Outline a synthesis of p-bromonitrobenzene from benzene in two steps .

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12. Give the structure of (A) (exphanations are not resquired). $A(C_3H_9N)$ reacts with bezenesulphonly chloride to give a solid insoluble in alkali'.

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13. Complete the following with appropriate structures :

$2,3\text{-Dinitroaniline} \xrightarrow[(ii)\ Anisol]{(i)\ NaNO_2 \text{ and } HCl at 5^\circ c} (A)$`.

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14. Write the structure of the foul-smelling compound obtained when aniline is treated with chloroform in the poresence of KOH.

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15. Give reason for the following in one or two sectences :

'Dimethyl amine is a stronger base than trimethyl amine'

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16. Following reaction gives tow products . Write the structures of the products .

$CH_3CH_2NH_2 \xrightarrow{(CH_3CO)_2O, heat}$ (A).

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17. How would you bring about the following conversion (in three steps) ?

Aniline $\rightarrow$ Benxylamine .

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18. There is a solution fo p-hydroxybenzoic acid and p-amino benzoic acid . Discuss one method by which we can separate them and slso write down the confimatory test of the functional groups present .

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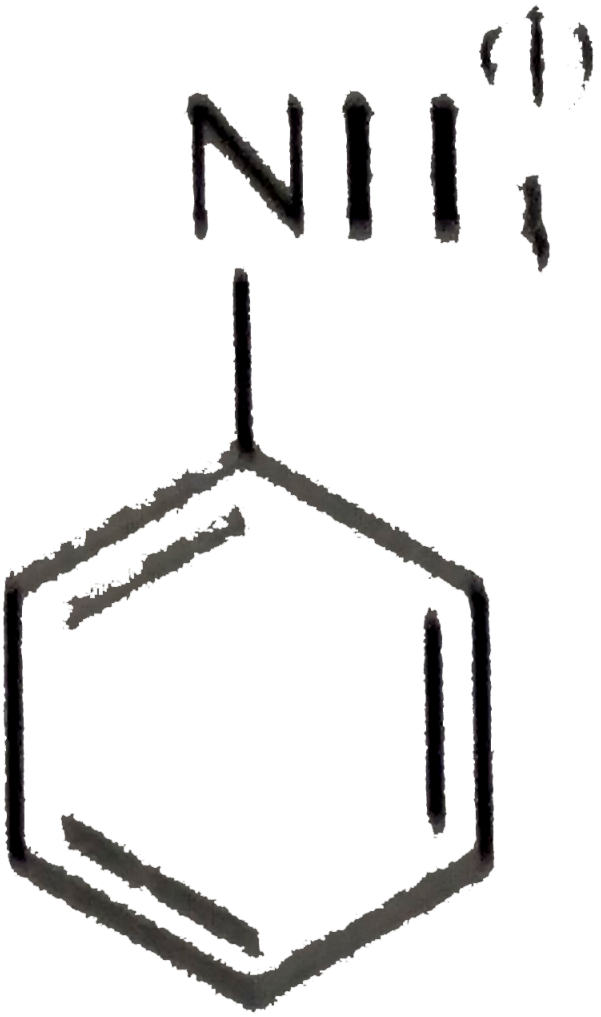
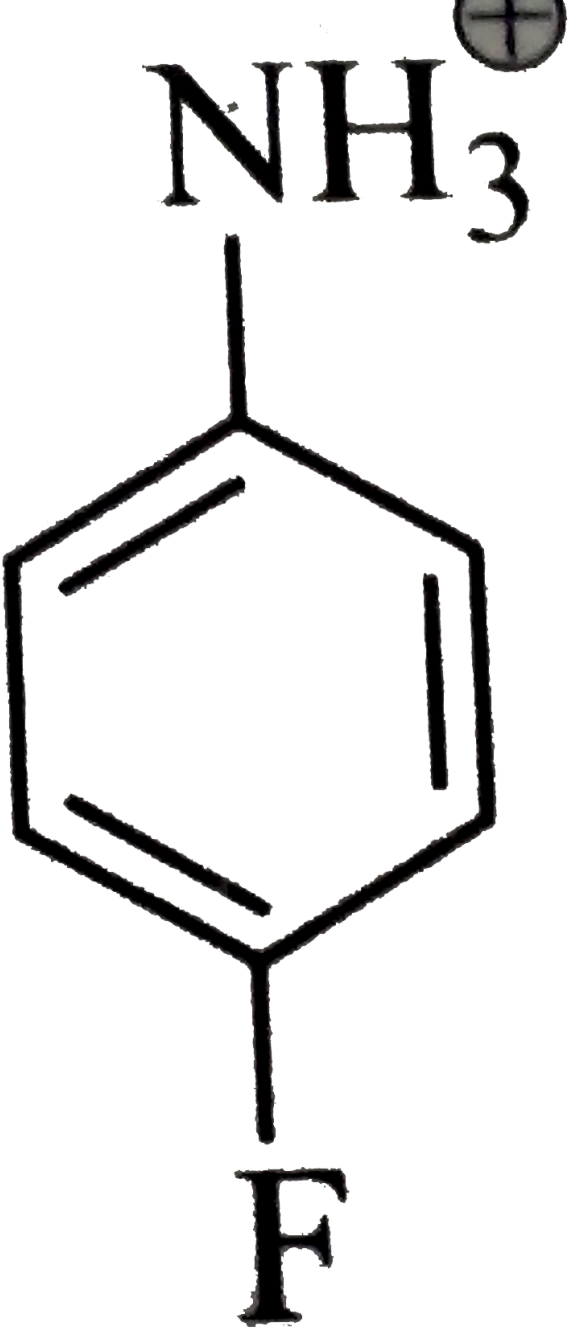
19. Which of the following is more acidic and why ?





(II)

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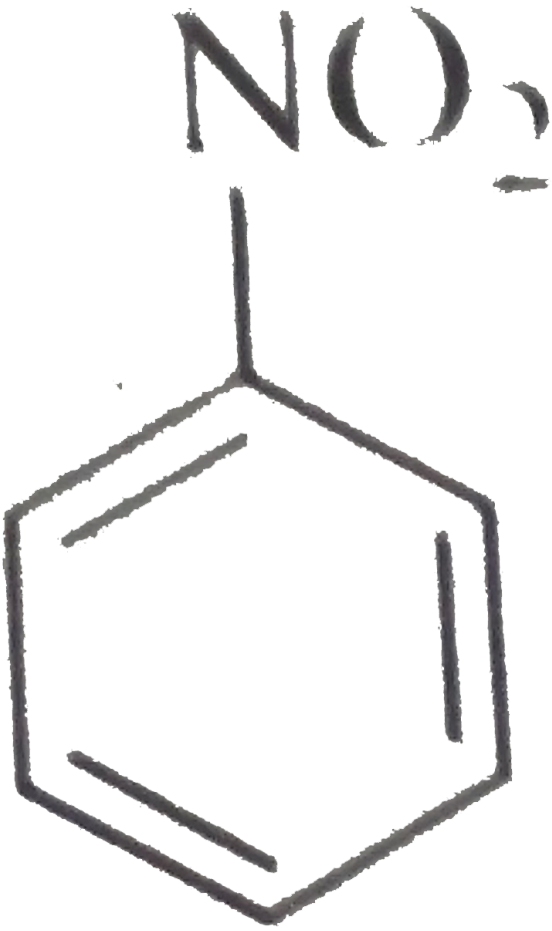
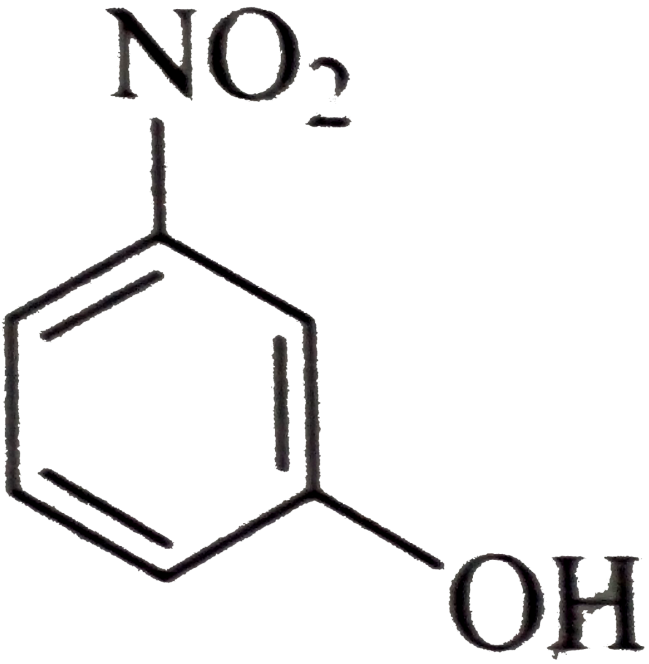
20. Convert





in not more than four steps. Also mention the temperature and reaction conditions.

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21. $\underset{\text{Optically active}}{\underset{(X)}{C_5CH_{13}N}} \xrightarrow[N_2]{NaNO_2/HCl} (Y)\text{Tertiary alcohlo} + \text{Other product}$

Find (X) and (Y) . Is (Y) optically active ? Write the

intermediate steps .

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22. A mixture of two aromatic compounds (A) and (B) separated by dissolving it in chloroform followed by extraction with aqwueous KOH solution. The organic layer containing compound (A) when heate with alcoholic solution of KOH produced a compound (C) (C_7H_5N) associated with an unpleasnt odour . The alkaline aqueous layer on the other hand , when heated with chloroform and then acidified gave a mixture of two isometic compounds (D) and (E) of molecular formula $C_7H_6O_2$. Identity the compounds (A), (B) . (C) (D), and (E) and write their structures .

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23. 

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24. An organic compound (A) $C_8H_4O_3$, in dry bebzene in the presence of anhydrous $AlCl_3$ gives compound (B). The compound (B) on treatment with PCl_5 followed by reaction with $H_2/Pd(BaSo_4)$ gives compound (C) which on reaction with hydrazine gives a cyclide compound (D) $(C_{14}H_{10}N_2)$. Identify (A), (B) (C), and (D) Explain the formation of (D) from (C).

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